DOMESTIC

ENCYCLOPÆDIA

VOL. IV.

MAC—S.NO

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Rob. Lewis.

THE

DOMESTIC ENCYCLOPÆDIA;

OR,

A DICTIONARY OF FACTS,

AND USEFUL KNOWLEDGE.

COMPREHENDING

A CONCISE VIEW OF THE LATEST DISCOVERIES, INVENTIONS, AND IMPROVEMENTS,

CHIEFLY APPLICABLE TO RURAL AND DOMESTIC ECONOMY.

TOGETHER WITH

DESCRIPTIONS OF THE MOST INTERESTING OBJECTS OF NATURE AND ART; THE HISTORY OF MEN AND ANIMALS, IN A STATE OF HEALTH OR DISEASE; AND PRACTICAL HINTS RESPECTING THE ARTS AND MANUFACTURES, BOTH FAMILIAR AND COMMERCIAL.

ILLUSTRATED WITH NUMEROUS ENGRAVINGS AND CUTS.

IN FIVE VOLUMES.

VOLUME IV.

BY A. F. M. WILLICH, M.D.

AUTHOR OF THE LECTURES ON DIET AND REGIMEN, &c. &c.

FIRST AMERICAN EDITION; WITH ADDITIONS,

APPLICABLE TO THE PRESENT SITUATION OF THE UNITED STATES:

BY JAMES MEASE, M.D.

AND FELLOW OF THE AMERICAN PHILOSOPHICAL SOCIETY.

PHILADELPHIA:

PUBLISHED BY WILLIAM YOUNG BIRCH, AND ABRAHAM SMALL,

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District of Pennsylvania: to wit.

Be it remembered, That on the eighth day of April, in the twenty-seventh Year of the Independence of the United States of America, William Young Birch, and Abraham Small, of the said District, have deposited in this Office the Title of a Book, the Right whereof they claim as Proprietors, in the words following, to wit:

" The Domestic Encyclopædia; or, A Dictionary of Facts, and Useful " Knowledge. Comprehending, a concise View of the latest Dis- " coveries, Inventions, and Improvements; chiefly applicable to " Rural and Domestic Economy. Together with Descriptions of the " most interesting Objects of Nature and Art; the History of Men " and Animals, in a State of Health or Disease; and practical " Hints respecting the Arts and Manufactures, both familiar and " commercial. Illustrated with numerous Engravings and Cuts. " In Five Volumes. Volume I. By A. F. M. Willich, M. D. " Author of the Lectures on Diet and Regimen, &c. &c. First " American Edition; with Additions applicable to the present situa- " tion of the United States. By James Mease, M. D. and Fellow of " the American Philosophical Society."

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(L. S.) D. CALDWELL,

Clerk of the District of Pennsylvania.

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ERRATA.

Page 19, column 2, line 4, *for* '1778,' *read* '1798.' Page 27, col. 1, line 7 from bottom, *for* FABIONI and DARAT, *read* FABBRONI and D'ARCET. Page 31, col. 1, line 18, dele the semicolon after New-York. Page 84. In the cut of Mr. Miller's Milk House, the letter A should designate the trough immediately surrounding the central platform B. Page 251, col. 1, *for* plate I. *read* plate II. Page 309, col. 2, line 17 from bottom, *for* faces, *read* fauces. Page 334, line 10 from bottom, in some copies erase the rl before *typhus*. Page 366, col. 2, line 21 from bottom, between 'which' and 'possesses' add, it. Page 408, col. 1, line 15, after the word shelf, read, be made of the same material.

THE

DOMESTIC ENCYCLOPÆDIA.

M.

MAC

MACE, the inner coat of the NUTMEG, is a thin unctuous membrane, of a yellowish colour, which it acquires by being dried in the sun. It is imported from India in flakes, about an inch in length, which present a variety of ramifications.

Mace emits a very fragrant, agreeable odour, and has a pleasant, though acrid and oleaginous taste. It is reputed to be an excellent carminative, and stomachic, possessing all the virtues of the nutmeg, but with less astringency. Its oil, whether distilled or expressed, is equally efficacious; and when taken internally in doses of from one to five drops, frequently affords relief in colics. Externally, it is of great utility, if rubbed on paralytic limbs; it also promotes digestion, and often prevents vomiting and hiccoughs, on being applied to the region of the stomach.

MAD

MAD-DOG. See BITE of a Mad-Dog.

MADDER, or *Rubia*, L. a genus of plants, comprising nine species, one of which is a native of Britain, viz. the *R. tinctorum*, Wild, or Common Dyer's-Madder. It is perennial, and flowers in the months of June and July.

The most proper soil for the cultivation of Madder, in this country, is a soft sandy loam, that has been in a state of tillage for several years, and which is at least 2½ or 3 feet deep, being perfectly clear from all weeds. It is necessary to plough the land, thoroughly, before the commencement of winter, during which it should be laid in ridges in order to *mellow*; and early in the ensuing spring, this valuable plant is propagated from slips, carefully taken from the old root: these slips ought, according to the late celebrated MILLER, to be set by the dibble, in rows at the

distance of two or three feet from each other; though, in the opinion of Bechstein, they should be planted only six inches asunder. And, as madder requires constant moisture, without which the young roots would shrivel and decay, it will be useful, before they are committed to the ground, to immerse them in a fluid paste made of the best garden mould and soft water. Besides, this transplantation should be undertaken only in rainy weather, or when there is reason to suppose that showers will speedily follow.

During the first summer, it will be sufficient to *scuffle* the plants with the *Dutch hoe*, as soon as the weeds appear: in the succeeding autumn, when the stalks or *haulm* begin to decay, they must be raked off the ground, and the intermediate spaces carefully dug with a spade or turned up with a hoe-plough: the soil being laid over the roots or heads of the plants in a roundish ridge. In the ensuing summer, the same management must be repeated; but, before the ground between the plants is hoed, the haulm must be laid over the next intermediate space for two or three weeks, at the expiration of which it should be turned back again on those intervals which have been hoed; care being taken to *scuffle* the soil, so that all weeds may be eradicated. In the following autumn, the haulm must be cleared, and the mould thrown up in ridges, similar to those of the first year.

Early in the third spring, before the young sprouts appear, the ground should be well raked; and, as soon as they are ready to be removed, they must be carefully taken off, at a distance from the crown of the parent plant. The culture of madder, during this summer, varies little from that of the two preceding, the plant only being earthed up somewhat higher; as it has now acquired more strength. As soon as the haulm begins to decay in autumn, the roots must be taken up, carefully dried under an airy shed; whence they should be conveyed as speedily as possible to a kiln; and managed in a manner similar to that followed with malt or hops; because the beauty of the colour greatly depends on the expedition with which it is prepared. From the kiln, the madder is conveyed to the *pounding-house*, where it is pulverized; in which state it is fit for use.

Madder is employed in considerable quantities for dyeing a fine red colour, and likewise as a first tint for several other shades: if wool be previously boiled in a solution of alum and tartar, and then immersed in a hot decoction of tartar only with this drug, it will acquire a very durable, though not beautiful, red tinge.

M. Margraaff obtained from madder a permanent *lake* of a fine red colour, which is applicable to every purpose of painting. He directs two ounces of the purest alum to be dissolved in three quarts of distilled water previously boiled in a clean glazed vessel, which is to be set over the fire. As soon as the solution begins to simmer, it ought to be withdrawn, and two ounces of the best Dutch madder added; after which the mixture is to be boiled once or twice, removed from the fire, and filtered through clean white paper. The liquor, thus strained, is now suffered to subside for a night; when the clear fluid must be poured into the glazed pot,

heated over the fire, and a strained solution of salt of tartar gradually introduced, till the madder be wholly precipitated.....This mixture is next to be filtered, and boiling distilled water poured on the red powder, till the fluid no longer acquires a saline taste. It now remains only to dry the lake, which will be of a deep red colour; but, if two parts of madder be used to one of alum, the shade will be still deeper; and, if one part of the latter article be added to four of the former; it will produce a beautiful rose-colour.....See also RED.

The root of the Common or Wild Madder, is an excellent detergent and aperient; on which account it has been highly recommended in visceral obstructions, particularly of the uterus; in coagulations of the blood, induced either by falls or bruises; in the beginning of dropsical complaints; and especially in the rickets....It may be given pulverized, in doses from five to fifteen grains to children, and from half to a whole dram, three or four times a day, to adults. When taken internally, it possesses the remarkable quality of tinging the urine with a deep red colour; and produces similar effects on the bones of animals, if eaten among other food.

Madder-roots pay, on importation, a duty of 5*s*. 1½*d*. per cwt. and are subject to a convoy-duty of 2*s*. 3*d*. per cwt. The same duty is paid for the drug imported in a manufactured state.

This root forms an important article for dying; and, in order to encourage its cultivation, the 31st GEO. II. c. 35, subjects persons convicted of stealing or destroying madder-roots, to make satisfaction for damages, at the discretion of the magistrate, for the first offence; or, in case of non-payment, the convict is liable to be committed to the house of correction for one month, or to be whipped; for the second trespass, such offender is to be confined in the house of correction for three months; provided the prosecution be commenced within thirty days.....Those who wish to acquire a more intimate knowledge of the culture, &c. of this profitable drug, will be gratified by the perusal of Mr. MILLER's "*Method of Cultivating Madder*," &c. (4to. 1758, 2*s*. 6*d*.) in which the subject is clearly treated, and illustrated with plates.

[Madder thrives in the state of Pennsylvania, and doubtless will thrive in every part of the Union. It is an accommodating plant, being a native of Persia, and yet flowering in the moist cold climate of the Batavian Republic. The province of Zeland is almost entirely covered with this plant, whence it is exported to every part of Europe and America, *YIELDING ALMOST INCALCULABLE PROFITS*. It is understood, that madder flourished formerly in South-Carolina, but little or no attention is paid to it at present.]

MADNESS, or *Mania*, one of the most distressing afflictions which humbles human nature. It is usually divided into two kinds, *melancholy*, and *raving*; but as they are so nearly allied to, and frequently alternate with each other, we shall treat of both in one connected view.

The distinguishing character of melancholic patients, is a gloomy and dejected countenance, for which no real cause can be assigned. They are seized with fear and trembling, so that it is difficult to

raise their animal spirits. The violence of the disease depends on the different subjects that prey upon the mind, which is extremely variable; inquiring after the most trivial matters; the habit is costive, the face pale, the pulse small and weak, while the stomach is distended with flatulency, and the appetite is uncommonly voracious. With respect to those strictly denominated *maniacs*, their condition may be ascertained by their bold and resolute aspect, while their eyes are suffused with blood; by the tremulous motion of the eyelids; an unaccountable aversion to particular persons or things; acuteness in hearing; and by their almost continual wakefulness. Those hapless individuals who have become *raving mad*, in consequence of fear, generally continue under the influence of that passion..... Such are the most striking symptoms, which vary towards the decline of the disorder; the victims of which are dull and stupid; or sorrowful melancholy, and sensible of their mental derangement.

Causes:....These are various, and often complicated, but may be aptly divided into two classes, namely, *mental* and *corporeal*. To the former belong love, fear, terror, pride, hope, joy; too ardent enthusiasm for liberty, or other passion that absorbs every faculty of the mind; too intense or too long continued meditation upon any person or subject; an ill-founded dread of the divine vengeance, occasioned by superstition, or false principles of religion, &c. Among the *corporeal* causes are blows, wounds, ulcers, bruises, or water in the head; congestions of blood in the brain; phrensy, or inflammation of that part, from whatever accident; too sedentary a life; the taking of poisons possessed of narcotic powers; suppression of the proper or natural evacuations, of cutaneous or other disorders; sensual excesses; schirrous or glandular obstructions of the mesentery, &c. Madness is in certain families hereditary; and a slight degree of it is sometimes perceptible after the small pox, intermittent, nervous, or other fevers.

Peculiarities:.....Uncommon strength of limbs; almost total insensibility not only to cold, but likewise to stripes, however severe; and an inability to support the exhalations of aromatic substances. As the disease is periodical, the patient is particularly affected during certain changes of the moon, and in the spring. Farther, maniacs are not liable to be attacked by any of the prevailing epidemics; on the contrary, they are frequently cured of their former complaints, or the progress of such disorders is at least suspended, during the continuance of their insanity.

Cure:.....If madness be the consequence of any other malady, its removal should be attempted by nourishing diet; clear air; gentle exercise, and the moderate use of wine. But, where this disease is hereditary, or has gradually increased from the patient's infancy, it becomes incurable: a similar fate generally awaits those persons, whose violent attacks, from whatever cause they may originate, have resisted every effort of art, beyond the space of twelve months.

In the earlier stages of madness, blood-letting, either in the arm or jugular vein, according to the strength of the patient, has been found eminently serviceable, but

if he be weak, or much exhausted, leeches may with advantage be applied to the temples. Considerable benefit has likewise been derived from emetics, such as ipecacuanha for more weakly constitutions, and antimonial wine, or tartarized antimony, for the more robust. The hot-bath; partial or total immersion in cold water, unexpectedly; purgatives; diuretics; and vitriolated tartar, have all been found occasionally useful in the progress of this disorder. Camphor has also been highly recommended; but it does not appear to be very efficacious. According to Dr. Locker, distilled vinegar has been successfully given to maniacal patients, whom it throws into profuse perspiration; and he observed, that they more speedily recovered, when the sweating was excessive, and of long continuance.

Formerly, the deplorable victims were chained, and scourged, lest they should injure themselves and others:.....a more humane treatment now prevails, and we trust that the *strait waistcoat* will always render such harsh conduct unnecessary, as it answers every purpose of restraining them from mischief. It will, however, be advisable, uniformly to maintain an ascendency over the patient, by a commanding deportment; as he will thus be impressed with a due sense of subordination, and submit to whatever regulations may be adopted for his safety, or restoration. Independently of this coercive treatment, attempts have been made to mitigate the violence of the disorder, by the liberal use of narcotics, especially of opium, which others have forbidden, as tending to increase the derangement. Instances, however, have occurred, in which large doses of that drug have effected a cure, when administered both externally and internally; either alone, or combined with camphor and nitre. Professor Hufeland observes, that tickling the nostrils with a feather dipped in laudanum, has afforded great relief during a fit of furious madness. A pillow stuffed with fresh hops has also, in many instances, composed the patient, and induced a salutary sleep.

The diet of persons labouring under this dreadful malady, ought to be uniformly light and thin; their meals should be moderate, and consist for the most part of nutritive vegetable food, especially during a course of physic. Their hours of employment must be regular, and their amusements adapted to their natural disposition: lastly, when the disease appears to be subdued, it will be requisite that the patient drink the chalybeate waters, and resort to the cold bath; as both remedies are eminently calculated to strengthen his whole frame, and to secure him against a relapse.

MAGGOT, the common name of the fly-worm generated in flesh, from the egg of the large blue flesh-fly, known under the name of *blue-bottle*. Its body is white and fleshy, destitute of legs or feet, and composed of a number of rings, similar to those of caterpillars; and the insect is capable of assuming various figures, being at times more or less extended in length, and consequently of a greater or smaller size, according to its different contraction.

Although we are not acquainted with any remedy, by which meat

or cheese infested with maggots may be recovered, and rendered fit for use, yet we shall suggest a simple expedient for preventing the generation of such vermin.... In hot climates, where the flesh of animals undergoes putrefaction within a few hours, it will be advisable to cover the meat with the leaves of the Swallow-wort (*Stapelia variegata* and *hirsuta*), natives of Africa; or with those of the Fetid Goose-foot or Orache (*Chenopodium olidum*), either of which possess a very fetid smell, that attracts the oviparous flies to deposit their eggs on these leaves, mistaking them for putrid flesh; but, as the young brood cannot subsist on vegetable food, they speedily perish....FUNKE remarks, that a couple of flies, according to a probable computation, may produce in one year, two millions of descendants.

MAGISTERY, a name given to almost every precipitate obtained by solution, as opposed to *calx*, which is procured wholly by calcination: it is chiefly employed to denote such precipitates as are used in medicine; for instance, the magistery of bismuth, coral, crabs-eyes, &c.

Magistery of Bismuth is a fine powder, prepared by dissolving bismuth in nitrous acid, and pouring on it a large quantity of pure water, which precipitates the magistery to the bottom of the vessel. It is chiefly employed as a cosmetic by the gay and giddy, on account of the superior beauty and dazzling whiteness which it imparts; but it is very pernicious to health, and eventually injures the skin....See BISMUTH.

Magistery of Coral, crabs-eyes, pearl, shells, chalk, and other absorbent matters, is prepared by dissolving any of these substances in the nitrous acid; when they must be precipitated by fixed alkali, and repeatedly washed in pure water, till the latter is perfectly tasteless.

Magistery of Lead is the calx of that metal, dissolved in aqua-fortis, and precipitated with filtered salt-water, by which means the powder acquires a beautiful white colour. It is softened by repeated ablutions, and then mixed with pomatums for improving the skin and complexion of the face..... Like all other preparations of lead, this magistery is a *slow poison*, and will therefore never be used by those who have the least regard for their health.

MAGNESIA, or *Magnesia alba*, a kind of absorbent earth, first discovered in the commencement of the 18th century. When pure, it is extremely white, loose, and light, being infusible, as it resists the heat of the most powerful burning lens. This earth, however, easily melts with borax; and is divested of its fixed air by calcination; in this state, it is less soluble than before, and does not effervesce with acids, but it may be safely taken internally.

Native magnesia is not found in quantities sufficiently large and pure for general use. It is therefore prepared by dissolving separately equal portions of Epsom salt and pearl-ashes, in double their quantity of warm water, when the sediment is to be strained: the two liquids are now to be mixed; adding eight times their proportion of warm water. The whole is suffered to boil a few minutes, being carefully stirred with a wooden spatula, to prevent the

powder from adhering to the bottom of the vessel. Now the liquid is to stand at rest, till the heat be somewhat diminished, when it should be filtered through a cloth, on which the magnesia will remain: lastly, it is to be washed till it be totally divested of its saline taste.

White magnesia is of considerable service for preventing or removing many disorders of children, especially of such as are troubled with a redundance of acid in the first passages; for which purpose it is preferable to the calcareous absorbents. But even magnesia is frequently misapplied, and ought never to be given to infants disposed to flatulency, or where no symptoms of acidity can be discovered; as it is otherwise apt to lodge in the bowels, and produce obstinate costiveness; being in itself an inactive earth, unless combined with acids. Hence it is often, and very properly, conjoined with rhubarb; so that children above one year old may take from five to ten grains of the former, and from one to two grains of the latter; while adults generally require one or two scruples of magnesia, and from five to ten grains of rhubarb for a moderate dose....See also HEART-BURN.

MAGNET, or LOADSTONE, a kind of ferruginous stone which in weight and colour resembles iron ore, though it is somewhat harder and more ponderous. It is occasionally discovered in iron mines, being sometimes in large masses of different forms and sizes, that are partly magnetic, and partly metallic. Its colour varies according to the country whence it is obtained; the best magnets, which are imported from China and Bengal, are of a deep blood-colour, those of Arabia are reddish; those of Macedonia, blackish; and such as are found in Germany, Hungary, England, and other parts of Europe, have the appearance of unwrought iron.

The distinguishing properties of the magnet are, 1. Its attraction of iron, as well as every matter containing ferruginous particles; and 2. Its inclination to the poles. Hence it is of essential service in navigation, and is employed in constructing the mariner's needles, both horizontal and inclinatory..... As this subject, however, is but distantly connected with our plan, we shall merely state the most simple method of making *artificial magnets*, which possess the virtues of the genuine loadstone, and have been found very useful in extracting particles of iron from the eye, and other delicate parts of the human frame.....CAVALLO directs the scales which fall from red-hot iron, when hammered, to be reduced into a fine powder and mixed with drying linseed-oil, so as to make a stiff paste; when it may be moulded into any form required. This mixture is to be put in a warm place for some weeks, till it become perfectly dry, and hard; after which it may be rendered powerfully magnetic by the mechanical application of the magnet. But this friction of the two metals should be performed in a direct horizontal line from north to south; by which simple process, if continued for a sufficient length of time, even two flat pieces of iron or steel may be easily imbued with the magnetic fluid, so as to evince, in a considerable degree, the proper-

ties of the genuine load-stone, without having been touched by the latter.

In order to increase the attractive power of the native magnet, it is frequently *armed*, that is, cased, capt, and provided with thin iron plates or bars, after its poles have been polished and properly regulated. Thus, it will support a weight 20, 40, nay 100 times greater than it could bear in its natural state; and by loading it with ponderous bodies, its force, instead of being diminished, is considerably improved. On the contrary, by charging a loadstone with an inadequate weight; exposing it to heat, rust, and lightning; by keeping it in an improper direction to the poles, or frequently dropping it on the floor, its virtues will soon be diminished.

MAGNETISM, ANIMAL, a sympathy which was lately believed to subsist between the magnet and the human body; and, in consequence of which the former was supposed to be capable of curing almost every disease.

This fanciful system was originally invented by Father HEHL, of Vienna, though first brought into general notice, in 1776, by M. MESMER, who realized a princely fortune in France, by imposing his doctrines on the fanatical and credulous; his pretended mysteries were at length completely developed by a committee of learned and ingenious men, who were appointed to investigate his pretensions. Although this successful juggler refused to explain the principles of his art, yet from the account of one of his most eminent pupils, it appears, 1. That animal magnetism is an universal fluid, pervading the whole creation, and forming a medium of mutual influence between the planets; and also between the earth and animal bodies. 2. It is the most subtle fluid in nature, being capable of flux and reflux; and of receiving, propagating, and continuing all kinds of motion. 3. That the animal body is subject to the influence of this fluid by means of the nerves, which are immediately affected by it. 4. It operates at a distance, without the intervention of any person. 5. That, notwithstanding its universality, there are certain animal bodies, which are not equally susceptible of this fluid, and the presence of which even destroys the effects of animal magnetism. Lastly, it cures all nervous disorders *immediately*, and others *mediately*: in short, its virtues extend to the universal cure and preservation of mankind!

Such are some of the principles of this wild and incoherent system, the fallacy of which has been so clearly pointed out, that we should have consigned it to oblivion, had not a similar farce been lately obtruded, and is still operating on the biassed part of the public. We allude to certain metallic, or even wooden, points, which professedly charm *all pain* from the bodies of animals, in whatever part it may be situated.....How is it possible to believe such absurdities, even though apparently corroborated by the testimonies of titled and untitled fanatics?

[MAGNOLIA, a genus of trees comprehending several species, most of which are natives of the United States.....1. *M. acuminata*, or Cucumber-tree, Long leaved-Magnolia. The cones or seed vessels are about three inches long, and resemble somewhat the cu-

cumber in shape, but are in part of a bright red colour. They are a common ingredient in bitters which they render very warm and pungent. They are used to cure the rheumatism, when infused in spirits.

2. *M. glauca*, Swamp Sassafras, Sweet Bay, Beaver Tree. It grows naturally in low moist ground, chiefly in the southern states; but becomes more regular, and thrives better in a high dry situation. From an experimental inaugural dissertation, published by Dr. PRICK, Philadelphia, 1802, it appears that the operation of the *M. Glauca* is similar to that of gentian and Columbo roots. The bark of the root is very astringent, and in all diseases where invigorating remedies are required, deserves the trials of physicians. MARSHALL (*Arbustrum Americanum*) says, the bark of berries have been used with success in rheumatism. Mr. BARTRAM informs the Editor, that the root in decoction, has been equally useful in the same complaint.

3. *M. grandiflora*, Ever-green Laurel, grows to the height of eighty feet in Carolina and Georgia: and is one of the most beautiful ever-greens. Mr. BARTRAM thinks it exceeds every other known vegetable when in flower. It is to be regretted, that it will not bear the cold of Pennsylvania.

The bark of the root was used as a substitute for the Peruvian bark in intermittent fevers, in S. Carolina, by Dr. LINING.

4. *M. tripetala*, Umbrella Tree.

5. *M. Auriculata*, supposed to be a variety of M. FRAZERI.

6. *M. pyramidata*.

7. *M. excelsior*. They all flourish in the open ground in Pennsylvania, except the *M. grandiflora*, and deserve to be cultivated for their beauty, and the fragrance of their flowers.]

MAGPYE, or *Corvus pica*, L. a crafty, and well-known British bird, which is about eighteen inches in length, and weighs from eight to nine ounces. It has a black bill, wings, and tail; but the latter are variegated with white, green, purple, and blue of different shades.

Magpies construct their nests with art, making a thorny cover, and leaving a hole at the side for admittance: the female deposits six or seven pale greenish eggs, thickly spotted with black. Similar to the crow, this bird feeds indiscriminately on both animal and vegetable substances; and, like the raven, it steals shining objects, such as buttons, knives, coins, and precious stones; which it carefully conceals in its nest.....Magpies not only destroy young ducks and chickens, but suck and empty the eggs in a hen's nest. When reared from nestlings, they become exceedingly familiar, and learn to talk many sentences, as well as to imitate every noise within hearing.....For the best method of taking them, we refer to the article CROW.

MAHOGANY, or *Swietenia*, L. an exotic tree growing wild in South America, and likewise in the Islands of Cuba, Jamaica, Hispaniola, and in those of Bahama. It was formerly very common in Jamaica; whence it was first imported to London in the year 1724; since which period it has been very generally employed for household furniture. Lately, however, it has become more scarce and expensive; because the low-lands in that island has been gradually thin-

ned of those valuable trees which could be readily carried to market, or transported on ship-board.

The mahogany tree grows very tall and straight, frequently among bare rocks, and attains a size of four feet in diameter: its wood is hard, admits of a fine polish, and is excellently calculated for chairs, tables, desks, and similar articles. It also affords strong and durable timber, and is usefully employed in the West-Indies for beams, joists, planks, boards, and shingles. Ships built of this wood are said to be almost impermeable to cannon balls, which lodge in the wood, or, if they pass through the planks, occasion no splinters.....The fresh bark of this tree has often been used in medicine, as a substitute for the Peruvian, and with equal success.

Many attempts have been made for painting and staining inferior woods, so as to resemble in grain and colour that of mahogany. As our own experiments have not afforded us complete satisfaction, we shall communicate the following recipe, which is extracted from the *Hanoverian Magazine* (in German) for 1786:...Take the planed boards of the elm or maple-tree; moisten them first with diluted aqua-fortis, and when dry, varnish them with a tincture made of two drams of dragon's-blood, one dram of alkanet-root, and half a dram of aloes digested in eight ounces of proof-spirit: by applying this liquor two or three times, with a sponge, or soft painter's-brush, it is said to produce the desired effect.

MAIDEN-HAIR, the COMMON MILTWASTE, or SPLEENWORT, *Asplenium Trichomanes*, L. an indigenous perennial plant, growing on old walls, rocks, and shady, stony places; flowering from May to October....Its leaves have a mucilaginous, sweetish, sub-astringent taste, without any peculiar odour: they are reputed to possess considerable efficacy, in disorders of the breast proceeding from viscid and acrid humours, when taken in the form of an infusion or decoction: hence they have been recommended for promoting the expectoration of tough phlegm, and removing obstructions of the viscera.

MAIDEN-HAIR, the GREAT GOLDEN, or GOLDILOCKS, *Polytrichum commune*, L. an indigenous perennial plant, growing in woods and moors, in wet boggy places; flowering in the months of May and June....The branchless stem of this moss frequently attains the length of eighteen inches; and, being covered with many long and soft leaves, it may be advantageously employed for besoms and brushes....LINNÆUS remarks, that the wandering Laplanders construct their couches of this elastic vegetable; and, according to STELLER, the inhabitants of Kamtschatka employ these stalks as wicks in their lamps made of earthen ware.

MAIZE, GUINEA-WHEAT, or INDIAN CORN, *Zea Mays*, L. [See CORN.]

MALLOW, or *Malva*, L. a genus of plants consisting of 53 species, four of which are natives of Britain: the principal of the latter is the *sylvestris*, Common Mallow, or Mauls, growing in hedges, footpaths, and among rubbish; flowering from June to August. The leaves of the Common Mallow possess a mucilaginous, sweetish taste, and were formerly often used in food, with a view to prevent cos-

tiveness. At present, decoctions of this plant are sometimes prescribed in dysenteries, and urinary complaints; though it is chiefly employed in emollient cataplasms, clysters, and fomentations. The flowers are eagerly visited by bees, which obtain from them an abundant supply of honey.

All the species of mallow, both indigenous and exotic, are beautiful plants, well calulated for ornamenting gardens, and affording grateful food to cattle; as they may be easily propagated by seed. But there are three, viz. the *Crispa*, or Curled Mallow; the *Peruviana*, or Peruvian Mallow; and the *Mauritiana*, or Mauritian Mallow; which, when macerated like hemp, afford a thread much superior for spinning, to that obtained from the latter vegetable; and the cloth made of the three species before mentioned, is said to be more beautiful than that manufactured of flax. From the curled mallow, which produces the strongest and longest fibres, excellent cordage and twine have been procured; and M. De Lisle, fabricated a new kind of paper from different species of the mallow, which not only served for the purposes of writing and painting, but also appeared to be eminently useful for drawing, and for the hanging of apartments.

Mallow, the *Marsh*. See Marsh-Mallow.

MALT, denotes barley prepared for brewing, so as to produce, by fermentation, a potable liquor, known under the different names of Beer, Ale, and Porter.

The operation of *malting* is performed by steeping any quantity of good barley, newly thrashed, in a leaden cistern containing river water, for the space of three or four days, or till the fluid acquires a bright red colour: but a more eligible method is that of changing the water every day, till the grain is sufficiently macerated, so as to *slip* out of the husk, when compressed between the fingers. It is then removed from the cistern, and laid in heaps to drain for two or three hours, at the end of which it is stirred, and formed into a new heap. In this state, the grain is suffered to lie for more or less than forty hours, till the malt is properly *come*; during which interval, it will be necessary to examine the barley at the expiration of 15 or 16 hours, because the grains generally begin to sprout about that time. An hour after the roots appear, the heap must be carefully stirred, so that the whole may equally germinate.

The malt is now to be spread out, and repeatedly turned over, for the space of two or three days, in order that it may properly cool; in consequence of which process it becomes mellow, disolves easily in brewing, and readily parts with the husk. To complete the process of malting, the barley is thrown up into a high heap, where, in the course of 30 hours, it becomes as hot as the hand can bear it, by which both its sweetness and mellowness are improved. Lastly, the malt is dried in a kiln, heated with coke, charcoal, or straw; the intensity of the fire varies according to the colour required; but, where wood or other vegetable fuel is employed, such materials ought to be perfectly dry; as otherwise the smoke arising from damp combustibles would greatly injure the grain.

[The art of malting cannot be acquired without some aid from experience. The use of the shovel,

for instance, on which much of the nicer parts of the process depends, requires method, and practice, which may readily be obtained, by frequent visits to the malt house, and by observing those who are habituated to the business, but cannot be described so as to be understood.

The best barley for malting, is bright and plump in its appearance, the grains full of meal, and should weigh from 46 to 50 lb. per bushel. It should be well cleaned and fresh thrashed, and must be put into a tub or some other convenience; and placed in a situation, where the water can be let off from the bottom, a grating being placed so as to prevent the barley from running out when the water is let off; it ought to be kept completely covered with water during the steeping, the time for which varies with the weather and the dryness or dampness of the grain. In warm weather, care must be taken to prevent any putrefactive fermentation from taking place in the steeping; from twenty-four to thirty hours is generally long enough, and it is better to let off the first water after fourteen or fifteen hours, and to put on fresh; this will prevent the fermentation, which, if suffered in the smallest degree, does considerable injury, and, if continued but for a short time would destroy vegetation. The fermention is discovered by bubbles of air on the surface of the water in the *steep vat*. In moderate or cold weather, the putting on fresh water is unnecessary, and it will require to lay under water from 40 to 60 hours, or until the grain is so much softened as to press tolerably easy when placed end ways between the thumb and finger. After draining six or eight hours, it must be taken out of the steep vat, and spread on the working floor, (and is then called a floor of malt) in cool weather about 12 inches thick, if the weather is moderate or warm, it must be laid thinner. After lying from twelve to twenty-four hours, it must be carefully turned; and this turning must be continued every eight or twelve hours until the process is completed....care being taken to bring on, and continue the vegetation as gradually and as regularly as possible, by thickening or thinning the floor, by a more or less frequent turning, or by opening or closing the windows of the malt house, as the state of the atmosphere may require.

The heat caused by the grain vegetating, should never be suffered to be more than moderately warm when the hand is put to the bottom of the floor; and it ought to increase gradually, from the moment the grain begins to vegetate, until the root is bushy, and the blade has found its way to the other end of the grain; the heat will then in a great degree subside, and the floor must be thinned in the turning to assist the cooling of it. Previously to every turning, the floor should be carefully examined, and if one part become warmer than another, it should be so mixed, that the vegetation may go on regularly in every part, and the blade in each grain complete its progress to the end at the same time; *on this, depends, in a great measure, the goodness of the malt*; for, if the blade in some of the grains, is at the end, while others have only reached the middle, those at the end will shoot out and weaken the grains, and the other will be malt no farther than the blade has progressed. If, owing

to a change in the weather, or from any other cause, vegetation should be checked in its progress, the floor must be moderately sprinkled with water at each turning, to endeavour to bring it on again. When the blade is at the end, which will be known by its making its appearance quite through some of the grains, it must be put upon the kiln, and a moderately strong fire put under it, and continued until the greatest part of the moisture be evaporated; if it be intended for *pale malt*, a moderate fire must be continued until it be perfectly dry: but if for *brown* or *porter malt*, the fire must be increased in proportion to the colour intended to be given; during the drying it must be frequently turned and mixed together on the kiln, and great attention is necessary if it is browned, to prevent its burning too much..... After it is taken from the kiln, it must be trodden and screened, to free it from the dust, and kept in a dry chamber until ground for brewing.

The malting of wheat and other grain is similar to that of barley, but varied agreeably to their different modes of vegetation."

For the above full account of malting, the Editor and his readers are obliged to J. KEYWORTH, of New-Brunswick, (N. J.) a professed English maltster, who wrote it for insertion in the present work.]

In order to *determine the quality of malt*, a handful of it should be thrown into cold water, where those grains that are imperfectly germinated will swim with one end upwards (Dr. DARWIN supposes with the root end); and such as are properly malted, float on their side; whereas sound, ungerminated barley, uniformly sinks in water. Another criterion of good malt is, its agreeable saccharine taste; and, likewise, if the whole contents of the grain easily crumble into powder, and dissolve in the mouth. In short, it ought to be pure, dry, and to emit a strong, though agreeable odour.

Mr. BORDLEY, an intelligent American farmer, advises his countrymen to buy malt, or exchange barley for malt, rather than to attempt the making of it; as the principal difficulty he found was in ascertaining the *heats* of the grain, while germinating. At length he succeeded, on attending to the directions given in the 5th vol. of MILL'S *Husbandry*. This practical writer observes, that during the first ten days the heat of the malt on the floor should be between 50 and 60 degrees of FAHRENHEIT'S thermometer; in the next three or four days, it is to be increased from 60 to 65 and 67°; and during the last ten days of its lying there, to 80, 84, and 87°; which last will be the proper degree of heat, when the malt must be laid on the kiln.

After the malt is properly ground in a mill, it is fit for BREWING; of which process we have already given an account under that article.

Malt-dust, or the refuse that falls from malt in drying, affords an advantageous manure for wheat-land, especially if it be scattered as a *top-dressing*: The proper quantity of this dust is 80 bushels per acre for wheat, and about 60 bushels for barley: it is also eminently calculated for grass-lands; and, if applied in the latter proportion, it will produce a very considerable increase of the best seed. Such manure, however, is most benefi-

cial to clay-soils, or stiff loams; as, on gravelly land, and in dry seasons, it will be apt to burn the soil. But, if the succeeding weather be moist, it will be productive of great benefit; for the first shower washes it into the earth, and thus secures the crop, which not only becomes finer and more abundant, but the soil is at the same time effectually cleared from the noxious weeds, that frequently vegetate, when common dung is employed.

As malt forms so essential an article of domestic consumption, and is not at all times within the reach of the poor, various recipes have been given for making beer with a small portion of, or wholly without malt: some of these having already appeared in our first volume, we now add the following method of brewing beer, as tending to diminish the consumption of, and thus in some measure to serve as a substitute for, that valuable grain. It consists simply in adding 28lbs. of dry, well-tasted brown sugar, to half a load, or three Winchester bushels of malt. The latter is to be brewed in the usual manner with hops, after which the sugar is to be introduced, and the liquor stirred till the whole is dissolved. Thus, a wholesome beverage may be procured at about three-fourths of the expence usually incurred by using malt and hops only; because a smaller proportion of the latter plant now answers the purpose.

Among the different patents that have been granted for inventions, or improvements, relative to the preparation of beer, the following claim more particular notice; namely, Mr. Dearman's for his contrivance of mills for grinding malt, in 1779; Mr. Jones's in 1798, for a machine, calculated to mix malt, or other substances, more intimately with fluids; and Mr. Tickle's, in 1801; for more effectually dissolving and extracting the virtues of malt, hops, and other vegetable substances. As our limits will not permit us to detail these pretensions to ingenuity, we refer the reader to the later volumes of the *Repertory of Arts and Manufactures*. In the 15th vol. of the same work, we meet with a communication from Mr. Joseph Coppinger, containing a description and plan of a malt and corn-kiln of his invention. He observes, that it is particularly adapted to the use of farmers, who frequently lose considerable quantities of grain during damp or wet seasons, for want of a similar contrivance. Its advantages are stated to be: 1. That it may be erected either in a loft or on the ground-floor, and at one-tenth part of the expence. 2. Any kind of fuel may be employed without detriment to the malt or corn dried in it. 3. The heat will be more uniformly distributed, without any waste, as is the case with most of the common kilns..... Lastly, the health of the attendants, necessarily employed, will not be exposed to certain injury, in consequence of their breathing, or sleeping in an unwholesome atmosphere; as their beds will be placed in a shed on the outside of the building. This circumstance, being of the greatest importance, deserves serious attention; and we trust that the contrivance here suggested, will be generally adopted. Consistently with our limits, however, we are obliged to refer the inquisitive reader to the volume last mentioned, where the whole process is amply described, and illustrated with an engraving.

[Lord Dundonald in his interesting work, (London, 1795,) on "*The Connexion of Agriculture with Chemistry*," suggests the advantage of feeding horses or cattle with corn, (oats) *malted*, instead of *raw*. Malted corn, he remarks, opens the body, cleanses the intestines, and removes obstructions, which effects being attained, it no longer operates in this manner, at least in no degree inconsistent with the health of the animal, and recommends that a comparative trial be made in feeding two teams, with malted and unmalted grain of the same sort and quality. Three months would ascertain the question.

The experiment is certainly worth making: and it is highly probable, that a portion of malted grain, at least, would add to the nourishing quality of the food, from the evolution of sugar which the malting of the grain produces. A few messes would have a fine effect upon the hide of an animal, after a winter's confinement in the stable; and might *probably* free the milk of cows from the bad flavour derived from turnips, cabbages, or our *great bane*, *wild garlic*.]

Malt-spirits. See Spirits.

MAN, the chief of the animated world, is distinguished from all living creatures by his superior faculties; being possessed of reflection, thought and power of invention, and an ability of carrying his conceptions or designs into effect. Formed for society, he seldom lives in solitude: and as an emanation of divine light appears to direct all the *good* actions of mankind, we excel every created being, while we enjoy the exclusive faculty of communicating our ideas, by speech as well as by letters.

Men are divided into classes chiefly by their colour, that varies according to the situation of the country in which they reside. See Complexion. Their bodies are erect, and seldom exceed six feet in height; they are almost naked, excepting a few hairs; and though nature has refused a general covering of the skin, man still remains her master-piece; as, conformably to Sacred History, he is the last work that proceeded from the hands of the Creator. The form of his body; the powers of his mind, supported by that innate spirit which governs (or at least ought to guide) his actions, and to which the faint appellation of *reason* has been given; together with his discernment of good and evil;.....all evince his superiority over the whole animal kingdom.

With all these advantages, however, mankind labour under innumerable wants, which the present work is designed to supply; namely, as far as respects domestic and rural affairs, as well as other subjects more or less connected with animal economy....To describe the various parts of the human frame, is the province of anatomists; and, as it would be foreign to our plan to discuss the social, moral, religious, and political relations of man, we trust the present brief sketch will suffice. Let it, however, be observed, that the generality of mankind have no reason to complain of the shortness of their existence; for, as they receive, at their birth, the germ of a long life, it must be attributed partly to their own neglect, partly to the concurrence of accidental and extraneous causes, which they cannot prevent or foresee, that they do not attain such an age as their natural consti-

tutions may seem to promise. Hence we ought to be very circumspect in our family connections, and modes of living; because, it is either from a blind choice in the former, or an imprudent conduct in the latter respect, that so many are the victims of hereditary disease.....See LIFE, and LONGEVITY.

MANDRAKE, or *Atropa mandragora*, L. an exotic plant, growing in Spain, Portugal, Italy, and the Levant: it is propagated by seeds, and treated in a similar manner with the more tender exotic plants.....According to BECHSTEIN, the carrot-like root of the Mandrake, in its native climate, penetrates from three to four feet deep into the soil, where it remains sound for fifty years....The plant is divided into *male* and *female*, the vegetation and growth of which are alike in both: though the leaves, roots, and seeds of the latter are longer, narrower, and of a darker colour than those of the male.

The fresh root of the mandrake is a powerful purgative, and may be taken in doses of from ten to twenty grains in substance; or from half a dram to a dram in infusion. It has been found very serviceable in hysterical complaints, but ought to be cautiously used; for, if administered in too large quantities, it occasions convulsions, and even proves deleterious.....The mandrake possesses narcotic properties, and is sometimes employed in emollient cataplasms and fomentations, for discussing hard tumours and swellings.

MANGANESE, or *Magnesia nigra*, a dark-coloured native mineral, found in a more or less impure state, both in iron-mines, and in the lead-mines of Mendip-hills, in the county of Somerset.

Common manganese is very heavy, moderately hard, and of a deep dusky grey, approaching to black, but sometimes of an iron-brown cast. It emits sparks with great difficulty, when stricken against steel; nor does it effervesce with acids, though the latter make a partial solution of it when calcined.

Considerable quantities of manganese are employed in glass-works for purifying glass; as it destroys the effects of colouring substances, and renders vitrified matters perfectly clear; from which property it has received the appellation of *Soap of Glass*. Farther, it imparts to a large quantity of glass, in a state of fusion, a purplish or reddish tinge, that disappears if continued in the fire: the colours may, according to CRONSTEDT, be easily effaced by the calces of arsenic or tin.....Manganese likewise communicates various tints to warm water, such as green, purple, red, blue, &c. which change on agitating that fluid.....When distilled with the muriatic acid, or spirit of salt, this mineral yields the oxygenated muriatic acid, or *Bleaching Liquor*, of BERTHOLLET. ....It is also employed for glazing earthen-ware, which thus acquires a black colour.....After being calcined in a strong fire, it has been recommended medicinally, as an astringent; of which, however, we have had no experience.

[*Manganese* has been found in Virginia, and is now sold in Philadelphia for a trifling price.]

MANGE, a disease affecting dogs and swine, in a manner similar to the itch in the human body;

and arising from an insect that works its way beneath the uppermost skin; where it causes so great an irritation, that the animals rub or scratch themselves, tearing off the head of the pustule, which occasions a scab, and, in a short time, an ulceration. This disorder, especially in dogs, originates from too high feeding, want of exercise, and an opportunity of refreshing themselves with dog's grass; from being starved at home, so that the animals are compelled to devour carrion, and excrements abroad; from want of water, or neglect of cleanliness in their kennels. It is induced in swine, by suffering them to lie in their styes, without clearing away their ordure.

As the malady is entirely situated in the skin, the cure may be effected in dogs, by giving them a small quantity of fine pulverized sulphur, either in milk, or incorporated with butter, and rubbing them daily, for the space of a week, with an ointment consisting of sulphur and hog's-lard: to which should be added a small portion of oil of turpentine. Another remedy is obtained by boiling four ounces of quicksilver in two quarts of water, till the quantity be reduced to one half: with this liquid the animals are to be washed regularly, and ought also to take a small draught of it every day, during the continuance of the eruption.

With respect to the mange in hogs, Dr. Norford (*Annals of Agriculture*, vol. xv.) recommends the following ointment, which seldom fails to effect a perfect cure, provided it be properly applied, and the animals be kept clean, after the disease is removed:.... Take three ounces of hog's-lard, one ounce of fine flower of sulphur, two drams of white hellebore, newly pulverized, and half an ounce of the water of kali, prepared in the shops. These ingredients are to be thoroughly incorporated, so as to form an unguent; the whole of which is directed to be rubbed on the animal at one time, and is said to be sufficient for a hog of six or seven stone: if the ointment be properly applied, there will be no occasion for any repetition.....Should, however, a slight cough affect these quadrupeds, after the cure is performed, it will be necessary to give each, according to its size, from half an ounce, to an ounce and a half, or even two ounces of crude antimony, properly levigated and mixed with some of his daily food, for the space of ten days or a fortnight, by which simple remedy, the hogs will be effectually restored.

When these animals have been long neglected, their necks, and various other parts of the body become affected with loathsome chaps or cracks. In this case, the best remedy is, to anoint the ulcerated parts every three or four days, till they are healed, with a little tar-ointment, prepared by dissolving equal parts of tar and mutton suet over a gentle fire, and straining the mixture while hot. But the most certain preventive of the mange, and its subsequent disagreeable effects, is the strictest attention to the health and cleanliness of the animals. For this purpose, every part both of the kennel and of the stye ought to be thoroughly swept, before they are littered with fresh straw; nor should a clean bed be spread over a foul or dirty one, as is too fre-

quently the case with careless and negligent servants; who, regardless of their master's interest, thus eventually cause the destruction of many valuable dogs and swine.

MANGE, in *farriery*, a cutaneous disease, to which horses are occasionally subject: it arises from poor feeding, and is therefore chiefly found in such cattle as are kept by the lower classes of people.

This disorder is easily known by the tawny appearance of the skin, which is thick, and full of wrinkles, particularly on the mane, loins, and tail: the ears and eye-brows, as well as the diseased limbs, are totally divested of hair; while the little, still remaining on those parts, is very stiff and bristly.

If the mange be contracted by infection, it may be easily removed by anointing the horse daily with a salve prepared of sulphur and hog's-lard; at the same time giving him sulphur and antimony for some weeks, after the eruption has disappeared. But, if the disorder originate from low feeding, and thin, impoverished blood, the diet must be changed, and the horse allowed a proper quantity of sweet hay and corn. Hence the animal's food should consist of warm mashes composed of equal parts of malt, or oats, and of bran, to each of which ought to be added four ounces of honey, and one ounce of sulphur. These are to be given every night and morning, for the space of a week or ten days, during which the horse should receive a measure of dry corn at noon: an ounce of nitre is likewise to be dissolved in water, and given every night and morning, during the taking of the mashes. At the expiration of that period, his diet should be changed to good oats and sweet hay; the corn be moistened with water, and a dose of the following incorporated with it, every night and morning: Take a pound of sulphur, and an equal portion of prepared antimony; let them be well mixed in a mortar, and divided into twenty-four doses.

With respect to the external treatment, every infected part ought, previously to the commencement of the mashes, to be carefully washed with a pailful of warm water, in which a quarter of a pound of soft soap has been dissolved, so that all scurf and filth may be completely removed. The animal is then to be gently dried, and on the succeeding morning, every disordered limb is to be anointed with the following preparation: Take half a pound of strong mercurial ointment; three ounces of pulverized white hellebore; one ounce of black pepper in powder, and a similar quantity of oil of tartar..... The whole must be incorporated with a sufficient quantity of sweet-oil, to give it a proper degree of softness; and the unguent should be repeated for seven, or ten days, or even a fortnight, according to the urgency of the symptoms, or the virulence of the eruption. The powders of sulphur and antimony, as well as the nitre, ought to be continued for three weeks, or a month; and, lastly, when the horse appears sufficiently invigorated, he should lose a small portion of blood, and afterwards swallow, at different times, two mild purgatives, by which a complete cure will be effected.

MANGEL-WURZEL, or ROOT OF SCARCITY, the *Beta albissima*, L. is an exotic variety of the *Beta Cicla*. It is propagated from seeds,

one or two of which are deposited, in the month of April or May, in holes dibbled at the distance of from eight to eighteen inches asunder.

The white and red-streaked roots of this plant are large and fleshy; affording excellent fodder for cows, to whose milk and cream they communicate a delicious flavour.

The Mangel-Wurzel produces abundance of leaves, which are greatly relished by horses, sheep, cows and hogs; for the two last mentioned animals, however, it is necessary to cut them off the plant; because they are said to refuse eating the fresh herbage from the roots. These leaves, being remarkably tender, are dressed on the Continent in the same manner as spinach. See BEET and SUGAR.

In those parts of Germany where the Root of Scarcity is cultivated, farmers prefer it to potatoes, turnips, carrots, and every other vegetable for feeding cattle: as both its root and leaves are free from the depredations of insects; but they acknowledge, that the animals do not fatten so readily on this as on the vegetables above specified.... Although the Mangel-Wurzel has not answered the high expectations that were formed of its utility in Britain some years since, it is a valuable plant, and deserves the attention of agriculturists; as there is no doubt that in certain soils, and in particular situations, it may prove a most useful article for the purposes above stated.

MANGLE, a valuable domestic machine, employed for the purpose of smoothing such linen as cannot be conveniently *ironed*.

[There are various forms of Mangles in England; the most approved of which is that lately introduced by Mr. Jee, who was rewarded by the Society of Arts in London, 1778, with a silver medal, for his improvement. It is described and illustrated in their transactions for the above year.]

Mr. JEE'S mangle is so constructed, that the handle requires to be turned one way only, in consequence of which the machine moves with greater facility, and with incomparably less injury to the linen, than by varying the turnings, and in a manner cutting the different folds. Besides, it possesses the great advantage, that a woman and one boy are sufficient to work it, and can perform as much labour in the same period of time, as three or four persons with mangles of the common construction.

[Mangles are highly useful in preventing the necessity of ironing all plain articles of linen or cotton, which is a serious and laborious task in a warm day in the United States, and the source of much indisposition among females. Mangles are made in Philadelphia by WRIGHT, Cherry-Street.]

MANGO-TREE, or *Mangofera*, L. a native of the East-Indies, whence its unripe fruit, preserved in vinegar, is imported under the name of *mangoes*.

This lofty tree attains a considerable size: its fruit, when fully ripe, is as large as a goose egg.... and greatly esteemed in the East, on account of its invigorating odour which is said to restore the health of persons in a declining state. Beneath its rough shell, there grows a kernel similar to that of almonds, and which may be eaten either fresh, or preserved:

from the expressed juice, the Indians prepare wine; and the remainder produces excellent flour.

Every attempt to propagate the mango-tree in Europe, has hitherto failed; and MILLER is of opinion, that the stones will not vegetate, unless they be planted shortly after the fruit is ripe. He therefore suggests the expedient of importing the young plants from India, in boxes filled with earth; so that they may afterwards be kept in the tan-bed of a hot-house.

MANNA, the juice obtained from several species of ash, particularly the *Fraxinus rotundifolia* and *Ornus*, growing in Italy and Sicily. When naturally concreted on the tree, this juice is called manna in the *tear*; but if it exude on straws or chips of wood affixed to the tree for that purpose, it is called *canulated*, or *flaky* manna.

This drug, commonly sold in the shops, is obtained by making incisions in the tree, after the spontaneous exudation has ceased: it consists of larger masses, and is of a deeper red than that which flows without wounding the tree.

The best Calabrian manna is imported in oblong, light, friable flakes, or pieces of a whitish, or pale yellow shade, and somewhat transparent. The inferior sorts are moist, unctuous, and of a darker colour.

Manna is a mild and agreeable laxative, which may be safely administered to children and the aged; though, in some constitutions, it is apt to induce flatulency, and to distend the bowels; but this inconvenience may be remedied by the addition of a little cinnamon water, or other warm aromatic..... The dose for children is, according to their age, from one to three drams; and for adults, one ounce, or one ounce and a half: as, however, its operation, when taken by itself, is very mild, and sometimes imperceptible, it is generally given in laxative mineral waters, or combined with salts, senna, rhubarb, or similar aperient medicines.

Lastly, we can speak from experience, that *manna* is one of the most useful demulcents in the humid asthma, and similar pituitous as well as inflammatory affections of the breast; that it beneficially promotes expectoration, and is of peculiar service in the second stage of the small-pox, or during the suppuration of the pustules.

MANSLAUGHTER, a species of homicide, denotes the unlawful killing of another, without any malice, either expressed or implied.

MANUFACTURE, signifies a commodity, or piece of workmanship, produced from raw materials, whether by hand, or by the aid of machinery.

The extensive utility of manufactures to a commercial nation, is generally acknowledged; and it is a circumstance worthy of remark, that the greatest improvements have, in general, proceeded from persons of no liberal education.

MANURE, denotes any substance employed for improving land, whether by remedying its natural poverty, or by correcting its too great stiffness, looseness, or other qualities unfavourable to vegetation.

[The following general observations on manure, for which the Editor is indebted to Mr. COOPER of Northumberland, may furnish more

accurate ideas than commonly prevail on the subject.

Writers on agriculture, ignorant for the most part of the physiology of animals, as well as vegetables; have usually considered and treated of plants, as inanimate beings: they are not so. Every plant is the production of an organized seed, endued with the property of vegetable life, and of being acted upon by appropriate stimuli. This vegetable life is originally excited and subsequently continued by the application of what may be called *natural* stimuli, much in the same manner as in animals. Thus the pollen of the pointal received by the chive, and thence propagated to the seed vessel impregnates the seed, and excites the action of the living fibre, which afterwards proceeds according to the laws of organization peculiar to each plant. This action is continually renewed by the application of vegetable food, by means of which the germ is dilated 'till the plant arrives at its full growth. All this is perfectly analogous to the impregnation of the animal germ in the ovarium and its subsequent growth to full size and age.

In animals the muscular fibres have the property of contracting on being irritated, (*irritability* as it is called,) so have vegetable fibres: the sensitive plant, the hedasyrum, the dionea muscipula of Carolina; the phenomena of plants growing in a dark place and turning to the light, are proofs of this, if not of voluntarity. The separated twigs of hedasyrum are irritable like a separated muscle. Mr. Howard has lately discovered the same property in the pollen on the application of alcohol. (*Transactions Linn. Society, London.*)

Animals have feeling, perception, or *sensibility* and the power of voluntary motion. So have plants. The facts adduced by Percival, Smith and Darwin, and the whole class of phenomena relating to their search of food and the propagation of their species seem to put this beyond reasonable doubt. To which may be added the habits and customs of the parasite plants.

Animals though perfect in all their parts may be stinted in their growth, by too small a quantity of food and by other means; and this diminution will affect the size of their offspring. The case is precisely the same with plants. By a plenty of food, and favourable situations, animals may be increased in size. So may vegetables. By breeding from selected couples of a large size, the size of the animal offspring is increased. Hereon was founded the successful practice of the greatest cattle breeder in England, Mr. Bakewell, of Dishley; and the same set of experiments has been repeated with equal success on plants by Mr. Cooper, of New-Jersey. Mr. Bakewell increased the flesh on particular bones of his cattle, and propagated this propensity. Mr. Cooper has, in like manner, propagated not merely increase of size, but increase of size in particular parts of the plant, and propensities to earlier vegetation.

In animals, appetite may be provoked and digestion assisted by the artificial stimuli of what physicians call condiments, salt, pepper, wine, acids, bitters, &c. Such also is the property of vegetables. Their hands, mouths, and stomachs are in the soil; and by the application of artificial stimuli, such as lime, common salt, alkalies, plaister of

paris, &c. their roots may be excited to want, to seek, to take in, and to digest more nutriment than they would otherwise take in.

Animals may be surfeited with too much nourishment. So plants will die, if set in a mere dung heap. Animals may be poisoned. So may plants. Every metalic combination, for instance, except oxygenated and carbonated iron*, the calx of manganese [and lead†,] and in small quantities, being poisons to the vegetable.

By the artificial stimuli of condiments, animals may be excited too much, and indirect debility will ensue. So is it with plants. In like manner excess of these artificial stimuli will take away their beneficial effects, as half a pint of wine may assist, when a bottle will injure digestion. Thus from the experiments of Sir JOHN PRINGLE, and Dr. WATSON (bishop of Landaff,) it appears that a small quantity of salt is a septic to the animal fibre, and a manure to vegetables; while a large quantity is the domestic antiseptic of cookery, and destroys vegetation altogether. So in the experiments of judge PETERS, two bushels of gypsum will produce a luxuriant crop, and six or eight will prevent it.

In animals, when parts of muscular or other fibres are weak, diseased, and dying, artificial stimuli can be applied to excite an action in the living and healthy parts, by which the dead are separated and sloughed off. So in plants, the artificial stimulus of those substances, which are not manures in the sense of affording nourishment to the plants, but only exciting a stronger and more healthy action in the living fibre; will kill the weak and diseased roots, while they invigorate the more healthy. This is the mode of action (in part) of lime, gypsum, salt, &c. usually classed among manures, but which do not enter into the composition of the plant itself.

Animals are resolvable into lime, gasses and phosphoric acid. There is no peculiar animal earth. The phenomena of marine animals, the experiments of VAUQUELIN on the production of lime in the hen, and some other facts, make it probable that the lime of the bones, as well as their phosphoric acid, is the product of animalization. Vegetables are resolvable into gasses and fixed alkali by fire; by putrefaction their alkali is decomposed, and escapes in the form of volatile alkali, for no fixed alkali is found on the incineration of vegetables which have undergone completely the putrefactive process. Both vegetables and animals contain in their fluids, accidentally, unessential quantities of iron, manganese, and neutral salts. Thus the blood contains iron, the serum and urine, microcosmic and phosphoric salts with the bases of lime, soda and volatile alkali. So in plants, nitre is found in borage, in nettles, &c. and ozalites in some. Hence it appears that the component parts of vegetables are very nearly the same; indeed the gasses into which they are each resolv-

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* This combination was found highly useful as a manure by Mr. JOSEPH WHITTEN of Kent, Litchfield county, Connecticut, for all garden vegetables. It answered better for Indian-corn, than either ashes or gypsum. See *Medical Repository*, Vol. II. p. 440...*Edit.*

† Sir J. BANKS was unable to make *arenaria verna* grow in his garden, until he procured the dross of lead, and surrounded the plant with it. See ANDERSON'S *Recreations*, Vol. I. p....*Edit.*

able form $\frac{1}{10}$ of their weight. We are aware of the experiments and observations, as yet inconclusive, of VAUQUELIN, GIRTANNER, HUMBOLDT, and LAMPADIUS, on the decomposition of alkalies and earths by means of oxygen; and although they are not yet satisfactory, we may fairly assert the probability of the conversion of lime into alkali, and that the difference of organization alone, makes that to be lime in an animal which is alkali in a vegetable.

Again: Animal fibres are made from plants. So true is the scripture exclamation, that all flesh is grass! An ox and a sheep are made up of vegetables, and so are we who devour them. Nothing is nourishment to an animal, but what was originally a vegetable. In like manner, nothing is nourishment to a vegetable, but what enters into the permanent composition of a vegetable. We find that large plants grow in pure sand (VAN HELMONT,) in sand and clay, in common clay, in lime-stone, lime-stone and sand, lime-stone and clay, and in all the combinations of these common earths: but we do not find that these earths, or any one of them, are permanent and essential parts of the composition of a plant, any more than of an animal. In a human body of 200lb. weight, may be found about the fourth or fifth of an oz. of common salt, and *perhaps* the same proportion of gypsum may be found in clover; but these are accidental parts of the composition. Hence manures of *nourishment* are distinguished from manures of *stimulus*, and from *mechanical* manures; and we are taught, that every vegetable, and animal substance, when decomposed, furnishes pabulum to vegetables, and that every such substance so decomposed is a manure of nourishment, and that nothing else is, or can be. It may be taken for an axiom, that from man to a cabbage or a lichen, nothing can be converted into nourishment for the living fibre, but what has been a permanently component part of living fibre before.

There are other properties of vegetables similar (rather than analogous) to those of animals, which the necessary brevity of this compilation will not admit. It may be observed, however, that plants, like animals, may be transplanted from one climate and soil to another, provided the difference be not very great, and care be taken to accustom them gradually to the change. Indeed, vegetables, like animals, will accustom *themselves* to the change in a generation or two, provided the difference be not above 8 or 10 degrees of latitude, or of mean temperature. The range is not yet ascertained.

On the preceding properties of vegetables and their analogies to animals, may all the agricultural doctrine of manures be well founded. These analogies have been remarked by others, but their application in this respect has not been heretofore sufficiently observed.

Animals *differ* from vegetables in having a more extended sphere of loco motion. The animal (except in cases nearly zoophytical,) can move the whole of his body from one place to another.....a plant can only move its root-fibres and its branches. The *convolvuli*, and other parasite plants are in some degree an exception, but the general rule is, that the immoveable centre of a plant's situation is the place where the germ falls, or the seed or plant is set with intent that it should remain. Hence the use of

that kind of manuring which consists in the admixture of soils of various depths and adhesion, for the mechanical purpose of keeping the plant steady.

II. Of the climate and soil.

No experiments have been made to ascertain with precision the bounds of latitude or temperature which prohibit the naturalization of exotic plants *. In France, YOUNG has marked the lines of the maize and the vine culture.... In this country maize grows tolerably well from lat. 42, and beyond it to Georgia. Wheat is not so good and productive south of Virginia, as in the middle states. The latitudes of cotton and rice are not yet exactly ascertained†. Coffee has not yet had a fair trial in our southern states, nor the sugarcane. Much indeed yet remains to be done in this respect, and much is doing by the British government in the West Indies.

Agriculturists have many vague denominations of soil, such as clay, loamy, marley, sandy, lime-stone, gravelly, stoney, poor light soil, rich black soil. These are tolerably descriptive in a general way; but as the theory of the art improves, we shall need more accuracy. Of the primitive earths, none need be noticed under this section, but silex or sand; argil or clay; and calx or lime. The others have never been yet found in sufficient quantity to produce any notable effect, except in the hurtful quality of magnesia when combined with lime, first noticed by Mr. TENNANT. It is evident that for the mechanical purpose of increasing or lessening adhesion, supporting the plant, and admitting its fibres to shoot more freely; clay, sand, and lime-stone are mutually manures to each other, acting mechanically by their mixture. Thus in Cheshire and Norfolk, in England, the clay and marle pits furnish an excellent and permanent manure to the sandy soil above.

But it is not merely the mechanical mixture of soils that may be useful; for the experiments of M. D'ARCET and M. FABRONI have shewn us that in the temperature of 100° of FAHR. different earths have different capacities for retaining moisture; so that by judicious admixtures, this valuable property in soils may be increased or diminished; and as none of the earths are found perfectly pure in soils, (clay, for instance, retaining 66 per cent. of sand without losing its distinctive character) a field is opened for ascertaining this property in different admixtures and combinations. For Mr. WEDGEWOOD discovered that earths would chemically combine in the moist way.

Besides the tenacity of soils, and their capability of retaining moisture, their *depth* is also to be considered by the cultivator. Some plants have long tap-roots, such as rhubarb, liquorice, carrots, parsnips, madder, &c. These are evidently unfit for any soils, but of loose adhesion and of considerable depth. Equally preposterous would it be to use a soil like the Genesee flats, of 20 feet deep of rich mould, for grasses that spread upon the surface. Again, where soils are naturally sandy, dry, and arid, and

* A useful hint on this subject shall be given under the article PLANT....*Edit.*

† The cotton line has been attempted to be drawn. See COTTON....*Edit.*

the climate warm, plants should be selected, whose roots penetrate deep and beyond the influence of atmospheric evaporation. Thus, in this country as in the south of France. Lucerne, (*medica*) and chicory (*cichorium intibus*) would be luxuriant where no other grass would grow.

We come now to consider (in this sketch III) the mode of accelerating the growth and increasing the size of plants.

This is done by *manures*. Hitherto, every substance added to the soil or to the plant while growing, which effected, or was meant to effect these purposes, was called a manure. But, from what has been said, manures ought to be considered, in at least, three divisions. 1. Manures of nourishment. 2. Manures of stimulus. 3. Mechanical manures.

Manures of nourishment. Five different theories have been started on this subject.

1. Practical men have for ages discovered the use of dung in agriculture, and hence the common and oldest theory was, that the juices of decomposed animal and vegetable substances were the chief pabulum of plants.

2. VANKELMONT's experiment suggested *water* as the pabulum, but although some plants will live, none will flourish in mere water. The French experiment of the decomposition of water, and the discovery of the excretion of oxygen seemed to give countenance to this theory.

3. Dr. HUNTER, of York, in his *Georgical Essays*, persuaded the world for some time, that oil was the pabulum of vegetables. But neither his theory nor his practice succeeded.

4. Dr. PRIESTLEY, who has more right to form theories and conjectures than any man living, (because he has furnished more facts of extensive application in chemical philosophy than any other man,) suggested that *phlogiston* was the pabulum. Some experiments of ARTHUR YOUNG, made in consequence of this supposition, tend to support it. But though in all probability *inflammable gas* may be converted into nutriment to vegetables, yet it is far from being true that this is the only gas which can. The gasses that escape from a dunghill are surely entitled to consideration; but, of these, inflammable air is but a small part; azote, carbonic acid, alkaline air, carbon, and perhaps sulphur, dissolved in alkaline air, are parts of the products of this decomposed mixture. We know too, that oxygen, carbonic acid, electricity, and the galvanic fluid, seem to aid vegetation to a certain degree: but the action of all these gasses and fluids are more satisfactorily accounted for, on the doctrine of stimulus, than of pabulum. That oxygen is not nutriment, is clear, from its being an excretion of plants in a healthy state, and in vigorous action, under the influence of the sun, as Dr. PRIESTLEY, and afterwards M. INGENHOUZE discovered. It is evident from numerous experiments, that plants take up watery fluids and juices; but there is no experiment that shews us, that they take up air of any kind, though they excrete it. Hence, although these fluids may contain the elements of phlogiston, or the combinations of phlogiston, this latter cannot of itself be taken as the food of plants. Both plants and animals are resolvable into

gasses, of which phlogiston may be a part, but there is something else which feeds and dilates the muscles of animals and the leaves of trees.

5. Dissatisfied with former theories, Mr. KIRWAN has proposed carbon or charcoal as the food of plants; and declares his opinion that if charcoal could be rendered soluble in water it would be the most efficacious manure. It is true that charcoal is found in the incineration of all undecomposed vegetables, and that they most probably contain much pure carbon, but they contain also much alkali, much oxygen, much azote, nitrogen, &c. nor is there any fact to prove that charcoal (or the oxyde of carbon) is either soluble in any liquid, or taken up as charcoal by any vegetable, or decomposed by any natural process; soot as a top dressing is a tolerable manure in England, but its use may be accounted for from the saline substances it contains. Whatever be the pabulum of vegetables, appears from every fact hitherto known, to be exhibited in the form of a *liquid*. That liquid may contain, and indeed generally does contain, (if dung be employed) the bases of hydrogen (or phlogiston) of fixed and volatile alkali, as well as azote, carbon, oxygen, and unascertained compounds of these. Hence it appears that, whatever theory of ingenious speculators be adopted as the simple and homogeneous pabulum of vegetable bodies in a living state, the old theory and the old practice must, and ought to prevail, namely, that the only manure of nourishment is dung, (*i. e.*) *decomposed animal and vegetable substances*; and although it may be of use by dung-heaps to aid this decomposition, yet even in an undecomposed, or partially decomposed state, that gradual decomposition amounts in the end to the same thing. This is applicable to ground-bone, woollen-rags, horn shavings, &c. All the difference is that *time is gained* by the artificial and complete decomposition of these substances.

Manures of stimulus. Whatever accelerates the growth, or increases the size of plants, and does not actually enter into the composition and substance of the vegetable, can only be considered as a manure, by stimulating the healthy fibre of the plant, by destroying the dead and decaying fibres, and by assisting the decomposition of undecomposed animal and vegetable substances dispersed through the soil. It is thus that *gypsum* or plaister of Paris acts, being the most efficacious septic among the neutral saline substances. Of these manures of stimulus, none are as yet in common use but lime, gypsum, and common salt.

Lime, is limestone deprived of its water and carbonic acid by fire. In this state its stimulating powers are obviously much greater, than in its natural and neutral state of limestone. But even pounded limestone is a promoter of vegetation on clayey and sandy lands, and this earth appears to be a specific stimulus to white clover, and perhaps to the potatoe. Hereto may be referred the rubbish of old buildings, and marle, which is clay with about one half of limestone [See LAND and LIME.

Common Salt. This, until the duty of two thousand per cent. in England, was a very common manure in Cheshire; the facts relating

to it, in this point of view, are collected in WATSON'S *Chemical Essays*. In this country, Gypsum is much cheaper.

GYPSUM, plaister of Paris, *vitriolated lime*, or *sulphat* of lime.... This has not been certainly found in any plant, but by M. MODEL, accidentally, in rhubarb, (*Journ. de Phys.* vol. 6. p. 14,) even this we suspect to be a fallacy; for the characters of gypsum were not then well ascertained. About two bushels per acre to clover or corn seem to be a full quantity. It attracts the moisture from the air, and dissolves gradually when strewed on the ground. It comes here from France and the bay of Fundy, and has also been lately found in New-Hampshire and on lake Erie. There is also some in Maryland on the Chesapeake, about one hundred miles below Baltimore, and in the Sulphur Spring (so called) on the road from Canadaraqua to Geneva. As it is not a component part of any plant, either in whole or in its own component parts, it cannot act upon healthy vegetables but as a stimulus, and upon diseased and dead ones, by its septic power. Experiments remain to be tried as to other manures of this description.

Mechanical manures. Their action in giving depth by new addition; in giving tenacity by mixture, as clay with sand, or, *vice versa*....in giving capacity to retain *moisture*, on the principles suggested by the experiments, of FABRONI and D'ARCET, is too obvious to require further elucidation.

Such are the ideas that occur as throwing some light on the theory of this complicated and most important subject, and suggesting the *rationale* of the application of manures in cases not hitherto well understood.

Gypsum particularly deserves attention, considering that it has effected almost a complete revolution in the agriculture of Pennsylvania. Many thousand acres of land hitherto barren, have been converted into excellent pasture ground, by its surprising influence. Even the products of land, tolerably good, have been doubled, and in some instances trebled by using it. The theory of its action was not until lately understood. Judge PETERS of this city, who first collected the opinions of our farmers, on the subject of the gypsum as a manure, ventured to suggest, that the vitriolic acid was the fertilizing principle of this manure. The chemists of our country either did not assent to the theory, or laughed at it. A fact however has lately been communicated by Mr. LIVINGSTON our minister in France, which would induce a belief in the theory.

"In an excursion," says Mr. LIVINGSTON, "I lately made into Flanders, I observed, at some distance from the road, several large beds of earth, that appeared to me to emit smoke and flame, which two men were tending. I stopped the post-chaise, and went to examine it. I found that it was Pyrites sufficiently impregnated with sulphur to burn when dry.... This was laid in beds and set on fire. They endeavoured to extinguish the fire when the ashes became of a red colour. If it burned longer, it became black, and the quality was not so good. This earth so burned, was easily reduced to powder, by a wooden mallet; and in this state, was carried on the

backs of asses forty or fifty miles as a manure, and was used, particularly for grass, at the rate of about six bushels the acre. The seed grain was also covered with it, as with gypsum in our country. This circumstance induces me to believe, that the sulphuric acid is, both in this and in gypsum, the fertilizing principle, and may suggest many other ways of applying that cheap material to the purposes of agriculture. It is very presumable that in this very slow combustion, the sulphuric acid is absorbed by the ashes, or other earths, while the inflammable matter is dissipated; and, that the union of the alkali and the acid forms a salt not unlike, in its chemical relations, the gypsum, or perhaps one that is more soluble, more impregnated with the acid. Perhaps diluted vitriolic acid, directly applied, would be found equally useful, or rendered more valuable by being combined with wood ashes, when native gypsum could not be conveniently had. If I rightly recollect, Du Hammel mentions that sulphuric acid scattered over weeds with a view to destroy them, made them grow with additional vigour. From the place where they were burning the earth, I proceeded to the ore bed, which I examined, and found the earth very similar to what I have seen on my own estate at Clermont, and which may indeed be found in many black meadows. Pyrites abounds in the United States; every farmer, therefore, ought to examine their estates for this substance with great care, as in all probability many of them contain treasures of this kind, of which the proprietors have hitherto been entirely ignorant."

For the purpose of supplying adult vegetables with nourishment, we should first consider, says Dr. Darwin, what kinds of matter are most prevalent or most necessary in their composition:

What of these substances they can absorb without previous decomposition, and lastly, How to expedite the decomposition of vegetable and animal substances on, or in the soil, like the digestive processes in the stomachs of animals; we may thus become acquainted with the sources and the management of manures.

Vegetables by analysis afford three essential principles, carbon, or the acid of charcoal; hydrogen or inflammable air; and oxygen or pure air: The proportion of which, vary according to the agents which have concurred to its developement, and according to the matrix which received and assimilated them, in order to create those combinations which are varied to infinity, by their forms and properties, and known by the terms of salt, oil, and mucilage. It appears, therefore, needless to seek those combinations in the different substances which are used for manure, when we wish to determine the nature of them, and explain their manner of acting in vegetation; because supposing it true, that these salts, these oils, these mucilages, exist in their combined state, nothing but their constituent elements abovementioned, can possibly have any action.

The substances which enter into the composition of plants, are, therefore, nothing but products of the decomposition of air and water, and combinations of the constituent principle, of these two

fluids, determined by their power which presides in the seed, and which thence has passed into the plant.

These observations, may serve to explain why the inherent characters of plants are more strongly marked, in proportion as the soil in which they grew is furnished with natural and mechanical means, to produce a quantity of gas, necessary to the formation of the substances on which those characters depend.

On this subject Dr. MITCHELL makes the following very just remarks. "There is good reason to believe, that particular manures ought to contain ingredients of the same nature and quality with those which the plants so manured are found, by analysis, to consist of. By proceeding in this manner, there can be rarely a mistake made in the application of manure. It is observeable in the order of creation, that certain vegetable bodies approach more near than others, towards the animal nature. The presence of septon, (azote) is the circumstance in the composition of organized beings, which particularly denotes animality, or the approximation to it. Septic manures being of animal derivation, ought therefore, if they entered into the constitution of plants, to make such as are nourished by them, take on somewhat of an animal nature. Let us now examine how this principle accords with facts. A familiar example may be taken from *wheat*. Wheat is most benefited by manures that contain septon. Street manure, door dirt, and well mixed barn-yard compost, all of which abound with septon, are among the best manures for that vegetable; and the efficacy of wood-ashes in making ground capable of producing great crops of that grain, is probably owing, (if modern conjecture be true,) to the septon, (azote) composing a part of the alkali it contains. Some of the swamp manures will also produce a good harvest of wheat, but others of them, though they cause a sufficient growth of straw, fail to fill the seed in the ear. The reason appears to be this. Where swamp manures happen to be charged with septic matters, derived from *animals*, or from vegetable substances that approach towards animal nature, they will produce plentiful crops of wheat; but when they consist merely of *decayed plants*, they are incapable of elaborating the grain in the head. The cause of this can be easily investigated, by attending to the analysis of wheat. PARMENTIER assures us of the presence of septon in the mucous part of meal; and he affirms, that the *glutinous* portion affords products quite similar to animal substances. If then, the land upon which wheat grows, contains a scanty quantity of septon, the seed will be poor and light in proportion to the deficiency of that article of food in the soil. Yet in this very ground, the roots of turnips and radishes may thrive exceedingly, and so many other plants, that do not employ septon as an article of their diet."

The above principles enable us to explain the utility of bones as a manure for wheat, which was mentioned in vol. i. p. 335. Bones, and the gluten or vegito-animal matter of wheat contain-

ing *phosphat of lime*. Cabbages too which contain sulphur ready formed, contract a bad taste in a soil composed of mud and dung; because these substances as they are decomposed, furnish a great quantity of septic gas, or of sulpherized hydrogen gas; yet plants of another class may grow in the same soil, without partaking in the smallest degree of the bad taste of that vegetable.

Plants too abounding most in oily saline, and mucilaginous principles, are generally such as require a soil well manured. Tobacco for instance, gives forty pounds of alkaline salt or potash from every hundered weight of ashes: this plant by being burned, may be converted into a very powerful manure, while other plants, which thrive in a middling soil, and appear as vigorous, are in general, such as have not so great a quantity of principles in their composition, and when thrown on the dunghill and left to rot, furnish very little manure.]

Manure is usually divided into four classes, viz. Animal, Vegetable, Fossil, and Fluid.

I. Animal Manures comprehend the several parts of animals, such as their fat, dung, urine, &c.

1. *Dung*....Having already pointed out the general properties of dung, under that article, we shall only observe, that the excrementitious matter of privies is supposed to exceed every other kind of manure, during the first year it is applied; in the second, its beneficial effects are less evident; and, in the third year they almost entirely disappear. The quantity necessary for land in a good condition is, by Mr. Middleton, computed to be about two loads per acre, annually; which in his opinion, will always preserve its fertility. He farther remarks, that exhausted ground may be perfectly restored, by laying on four or five loads of night-soil per acre, for the first year; after which, two loads annually will be found amply sufficient to keep the land in the highest degree of cultivation.

[The matter of privies is known to be a most valuable manure. In China and Japan, there are laws to prevent its waste. The cultivators prefer it to the manure from horses and cattle, as it does not contain the seeds of weeds, and is much stronger than stable manure.

If the privies of families were lined with cement, (which see) so as to retain the moisture; (the most enriching part) and if earth, fine sifted coal ashes, but more especially fresh slacked lime, were frequently thrown down the privies, all disagreeable and unwholesome smells would be prevented, and the quantity and value of the compost greatly increased. By this management, its removal would be also rendered inoffensive to those employed.

From *Simonde's view of the Agriculture of Tuscany*, a late and interesting work, it appears, that night-soil is as highly prized there, as in China and Japan; but he remarks the very disagreeable effluvia which exhales from it when spread upon the ground. It should *never* be used, except when joined with earth or vegetable matters, in the proportion of one to five or six.]

2. *Fish*.....Herrings, pilchards, and mackerel, afford an excellent manure, being chiefly used in those parts of Britain where they are caught in the greatest abundance,

and seldom fail to procure rich crops. In some parts of Cambridgeshire, sticle-back (*Gasterosteus aculeatus*, L.) are employed for the same purpose, in the proportion of twenty bushels per acre: and, if it were possible to introduce the CAVIAR (which see) into British seas, this measure would be highly beneficial to agriculture.

[From the experience of Mr. L'HOMMEDIEU of New-York, it appears; that fruit trees manured with fish, are brought forward much faster than those which have not the advantage of this manure. They are also in general use to prepare land for grain on the sea coast of New-York and in Connecticut. They must be spread and ploughed in.]

3. *Bones*, to which we refer.

[It may be here stated, in addition to what Dr. WILLICH says on the utility of this article as a manure; that in England, the grinding of bones for the farmer is now a trade. Bones mixed in a heap of lime, will soon be reduced to powder, but the farmer should observe whether the same beneficial effect would result from the use of the bones thus treated, as when powdered by the mill. An experiment, upon a small scale may be easily made.]

4. *Urine* is well calculated for manure: it is so far preferable to dung, as no seeds of weeds are deposited in the ground with the former; and, if the land be well watered with this fluid, such irrigation will be attended with the best effects.

5. *Horn-shavings*. See HORN.

6. The *chippings* or scraps of skins and hides (being the refuse, of furriers and curriers) are of great utility on land intended to be sown with wheat or barley. They should be scattered by hand on the soil, and speedily ploughed in; because any pieces, left on the surface, are immediately devoured by crows and dogs. The proper quantity of this manure is, two or three quarters per acre, which should be scattered a short time before the seed is committed to the ground: such chippings are peculiarly calculated for light, dry soils, but are seldom productive of any benefit to wet or clay lands.

7. *Sheep's-trotters*, and fellmonger's cuttings, are employed on similar soils, though in the proportion of from 20 to 40 bushels per acre. They should likewise be ploughed in, to prevent the depredations of dogs and crows.

8. The soiled or damaged *locks of wool*, or trimmings of sheep, deserve to be more generally known as a fertilizing article: they are at present chiefly used in the county of Surry, for ameliorating the hop-grounds.

9. *Woollen rags* are an excellent manure; but, instead of being collected in a heap, similar to a dunghill, they ought to be cut into small pieces in a paper-mill; strewed by hand; and ploughed in, three months before wheat or barley is commonly sown: the usual quantity is from six to ten cwt. per acre; though, in the county of Kent, a ton weight is spread on each acre, every third year, for hops. On account of retaining their moisture, such rags are eminently adapted to dry, gravelly, or chalky soils; the fertility of which will thus be considerably increased, especially during dry seasons. The only obstacle to their more general adoption, appears to be the apprehension entertained by many farmers, of

catching the small-pox by choping and scattering the rags; but, since the virulence of that disorder may be subdued by inoculation, those fears are certainly groundless.

10. *Insects*. See that article.

11. VEGETABLE MANURES are either whole plants, or parts of vegetables, together with their ashes, &c. which are sometimes ploughed in, while growing, and are afterwards burnt, or otherwise decomposed.

1. *Wheat-straw*, according to Mr. BORDLEY, is a very valuable article; but it ought to be ploughed in, "when it is *muck-wet* from soaking rains that have softened it;" for, if it be turned into the ground under less favourable circumstances, it is seldom of any advantage,

2. *Weeds*, such as dock-roots, cabbage-stalks, the roots of couch-grass, &c. are of great service: hence Dr. DARWIN pertinently remarks, that they should not be improvidently thrown into the high-way, or consumed by fire, as too frequently happens: on the contrary, if laid on the ground in heaps, occasionally turned over, and covered with soil, they will inevitably perish, and speedily ferment, on account of the sugar and mucilage which they contain. The decomposition of weeds is still more effectually accelerated, on adding quick or newly burnt lime, by which they are rapidly converted into a most valuable manure. For this purpose, Mr. HENRY BROWN, an ingenious chemist of Derby, directs a layer of green vegetable matter to be formed, about one foot in thickness, on which a very thin stratum of pulverized lime is to be scattered; and such alternate layers are to be continued till the pile is of a sufficient height. When these materials have lain together for a few hours, a dissolution of parts will commence; and, in order to prevent the inflammation of the whole mass, a few sods, or a small portion of fresh vegetable matter ought to be added. In the course of twenty-four hours, the process will be complete, when a quantity of excellent ashes will be ready to be laid on the land. Weeds and vegetables of every description, if used green, will answer the same purpose, and thus be productive of double advantage to the farmer; because they may not only be collected at a small expence, but will in a few years render his farm more valuable, by exterminating all noxious plants.

3. *Sea-weed* is a valuable manure for garden-grounds, and destroys every kind of vermin. The best is cut from the rocks on the sea-coast; but, as this marine vegetable is frequently thrown on shore, it may be useful to state, that the better kind resembles the haulms of peas; and the inferior sort is known by its long, shrub-like stalk: they may be either spread on the land in a fresh state, or previously laid up in heaps, and suffered to putrefy.

[*Sea-weed* is much used on the sea coast of New-York, as a manure.]

River, or pond-weed, and especially the *River-conferva*, are equally beneficial; being particularly calculated for turnips or wheat, if ploughed in upon a sandy soil; but they produce no effect on land that abounds with springs, or is liable to inundation:

the quantity laid on, varies from twelve to fourteen loads per acre.

Considerable benefit has likewise been derived from turning in vetches, buck-wheat, or rape upon old-ploughed lands, which are thus greatly improved....Turnips, when injured by the frost, may also be employed as a valuable manure; because they are believed to preprevent the germination of the seeds contained in weeds, which enter the heaps of dung; and, when stirred among the latter, promote their putrefaction.

4. The *ashes* of fern, stubble, peat, &c. of which we have already treated in our first volume. Article Ashes.

5. *Peat* is not sufficiently known as an article of manure. It is usually employed in a burnt state, for a *top-dressing*; but, as it is formed of the solid parts of morasses, and consists of vegetable fibres, more or less decomposed, it may be laid on clayey soils with the greatest advantage...Dr. Darwin remarks, that peat ought to be considered as an inestimable treasure to the farms in its vicinity: he suggests the propriety of throwing it previously into heaps, either with or without the addition of lime; then exposing it to the air, and draining the water from it, in order to expedite its decomposition.

["Peat or Moss Earth, is a valuable manure. From experiments made with alkaline salts (potash) and peat, says Dundonald, it can be asserted, that the effects of such a mixture, weight for weight are equal, if not supeperior, to those of dung.

Peat, when intended to be used as a manure, should be dug up at the depth of two or three feet from the surface, in small pieces, and left exposed to the air for three or four months, or till the dry weather of summer, or the frosts of winter, render it convenient to carry it away.

From a meadow dressed with forty loads per acre, with a compost, made of three fourth parts of peat earth, and one fourth part of dung, greater and more lasting crops of hay were produced, than from the like quantity of the best dung.

The most beneficial preparations or combinations of peat will be found to be:

Peat-earth, with dung and urine.

Ditto. with alkaline salt, or potash.

Ditto. with lime.

When the soil does not contain a due proportion of calcareous matter, (as old meadows,) the two last are preferred, until it shall have received a due proportion of this article, so indispensably necessably to produce sweet herbage.

One hundred pounds of alkaline salt or potash, are sufficient to saturate peat-earth enough to top-dress an acre."

In order to prepare peat with lime to the greatest advantage, Lord Dundonald directs fresh lime, completely slacked, to be mixed with 5 or 6 times the weight of peat, which should be *moderately humid*. The heat will be moderate, and not sufficient to convert the peat into carbonaceous matter, or to throw off, in a state of fixable air, the acids therein contained.... The proportion of lime should be carefully attended to, and the mixing of the two substances performed under a shed, as too much rain or

too great exposure to air, will prevent the due action of the lime upon the peat.

This preparation is peculiarly favourable to the growth of clover, and short sweet pasture grasses. Alkaline salts are of much greater importance, than lime, to mix with peat, as the peat is by them, rendered completely soluble.]

6. *Rape-cake*, which is obtained after expressing all the oily particles from rape-seed: it affords, when pulverized, an useful manure for wheat....*Rape-dust* is equally serviceable as a top-dressing for turnips; and should be spread on the land in the proportion of 10 cwt. per acre.

7. The bark of oak, or rather *tanner's waste*, which has been suffered completely to putrefy, affords an excellent manure for cold, stiff, clay-soils; one load being more efficacious than a double quantity of the richest dung.....If oak-bark be designed for grass-land, it ought to be spread shortly after Michaelmas, [29 Sept.] that the winter-rains may wash it into the ground: for, if applied in the spring, it will burn the grass, and exhaust, rather than ameliorate the soil, for that season. On the contrary, if intended for corn-fields, it should be spread immediately before the last ploughing, in order that it may be turned down, so as to come in contact with the early fibres or roots of the corn; because, when lying too near the surface during the winter, it unnaturally hastens vegetation; and, with the approaching spring, the young buds of the grain perish from the severity of night frosts.

III. Fossil Manures consist of various kinds of earth, sand, chalk, marle, &c. all which, in a greater or less degree, contribute to the amelioration of land. See Crag, Clay, Chalk, Gypsum, Lime, Marle, and Sand.

1. *Coal-ashes* (see Coal) are of extensive utility as a manure..... They are particularly adapted to clay-lands, for correcting their cold, ungenial quality; but they should not be ploughed in too deep. These ashes may likewise be employed as a top-dressing for clover, on dry chalky lands, over which they ought to be scattered in the months of March or April, in the proportion of from 50 to 60 bushels per acre: they have also been advantageously spread on *sward* or grass-lands, either in the winter, or during the spring.

2. *Soot*, which will be discussed in its alphabetical place.

3. *Clay*, when previously calcined or burnt, improves cold, wet, sandy soils; and has been found very serviceable to close, stiff lands. The excellence of this manure is very conspicuous in the North Riding of Yorkshire, where the ground is so sandy as to produce, with any other manure, only rye; with clay, it yields abundant crops of oats, barley, &c. The usual proportion, laid on meadow, pasture, or corn lands, is from ten to twelve loads per acre; and so permanent are its fertilizing properties, that it becomes unnecessary to repeat the operation of *claying*, for the period of forty-five years.

4. *Sand*, to which we refer.

5. *Salt* is justly asserted to be one of the most grateful manures to vegetation, as cattle are not only more healthy but fatten more speedily on pastures, where it has been properly scattered. It is of great utility for raising turnips, as well as for producing abundance of

corn; the straw being strong; the grain *thin-hulled*, heavy, and on the whole, better than that from many other manures. Besides, it sweetens sour pastures; improves and increases the herbage: while it destroys all noxious insects. The proper quantity is sixteen bushels per acre; for, if a large proportion be used, its beneficial effects will be diminished, and vegetation be eventually destroyed.

IV. Fluid Manures comprehend Water; Oil-Compost; Mud (which see); and all liquid matters that are employed with a view to ameliorate land.

Under the article Irrigation, we have treated of the utility of water, and pointed out the best manner, of applying it to the soil: we shall, therefore, at present, only remark, that the *liquor of farm-yards* has been successfully tried on meadows, and wheat-fields, both of which are thus rendered uncommonly fertile. This fluid may also be used with great advantage for land sown with barley, oats, or other grain; but, if it be intended for grass-land, it ought to be sprinkled on them only during the winter, when the rains wash the saline particles into the soil; or early in the spring, when the ground is laid up for hay; because no cattle will feed on the grass, while the salt or dung adheres to the blade....Farther, it will be necessary to convey this ameliorating liquor to the field during dry weather, when the dung-water in the reservoirs is of a deep-brown colour, and strongly impregnated with salt. Thus, the land may be irrigated as often as occasion may require; and the pools kept constantly empty, for the reception of fresh fertilizing matter.

As manure promotes the growth of plants; as its fermentation and warmth disposes the soil for the more easy admission of nourishing moisture from the air; and as it thus eventually contributes to the support and comfort of mankind, the manner in which it is to be applied, merits some attention.

Every kind of manure, Mr. Bordley justly observes, ought to be carefully collected, duly sheltered, and ploughed in, as speedily as possible after it has been carried to the field; the implements and labourers being ready on the spot. He directs the loads to be ranged in *lengths*; the dung to be spread and immediately ploughed in, "line by line;" because it more readily dissolves in the ground when newly covered, and its whole strength is thus secured to the soil.

[This is an important direction, for which there is much room.]

Where the manure collected in heaps is to be ploughed under clayey soils, that are liable to become too solid and impenetrable to the fibres of wheat, or other plants; and also, where potatoes, or similar bulbous roots are intended to be turned in, with a view to produce a crop beneath the soil; Dr. Darwin conceives the most advantageous method of using such compost would be, to bury it before it is perfectly decomposed; for it will thus prevent the surface of the land from becoming too firm: and, notwithstanding the putrefaction will consequently be somewhat retarded, yet the fertilizing substances will in the end totally decay, and afford to the roots an equal,

though more gradual, portion of nourishment.....The most proper season for ploughing or turning in such manures, Dr. Darwin agrees with Mr. Bordley, to be immediately before the seeds are sown, or the roots are set: because the atmospheric air, which is buried with the dung, in consequence of its union with carbon in the interstices of the earth, gradually evolves a genial heat, that greatly promotes vegetation.

With respect to those manures, which are to be spread on the surface of grass or other land, and which are called *top-dressings*, the most favourable season for applying them appears to be the early spring; when they should be spread over the soil in a state of coarse powder, or in small lumps which cohere but slightly; because the vernal showers will then wash them into the soil, so that the young stems of grass may easily penetrate.

[" The application of *top-dressing*, as observed by Lord Dundonald, has been too little attended to, in consequence of farmers being unacquainted with the advantages resulting to the ground, when converted from pasture to arable, by previously promoting the most luxuriant growth of perennial grasses. By assisting vegetation, and increasing the vigour of perennial plants, their roots are made to strike deeper down, and improve the staple of the soil: with annual plants the same benefit is not to be expected, as their growth and decay are limited to one season; were manures exclusively applied, under a system of convertible husbandry, to grass grounds, the lands would regularly be broken up, in due rotation of cropping; and there can be no doubt, but that a greater quantity of corn (grain) and herbage would annually be produced; and it is very probable that wheat and other grain would be less subject than at present to diseases, many of which, there is reason to believe are occasioned by the immediate application of dung previously to sowing. The articles most generally used in Scotland, as *top-dressings*, are lime mixed with rich black mould; lime mixed with peat, peat-ashes, coal-ashes, and soot."]

As, however, the proper mode of collecting and preserving manures is attended with considerable expense, the most economical manner of distributing it, requires no common skill. This object is in a great measure attained by the drill-husbandry, the principal advantage of which consists in putting the manure into *drills*. Mr. Parkinson (in his *Experienced Farmer*, vol. i. p. 32) directs such drills to be made at the distance of two feet from each other: thus, he sows wheat, peas, beans, and cabbages; from the result of which this intelligent cultivator maintains, that *four* loads per acre in the drill-husbandry, are equal to *sixteen* loads in the usual way of spreading it over the whole of the field.

Lastly, for situations where it is difficult to procure such manures as are conducive to the fertility of the soil, we shall communicate the following *chemical compound*, which was lately invented by Dr. Bahrens, a reputable German clergyman. According to the theory adopted by the continental writers on agriculture, those substances which yield, or evolve, the largest

quantity of *carbonic acid gas*, or inflammable air, afford the *principal matter of manure*. Consistently with this theory, Dr. BAHRENS has liberally published an account of the mode of preparing and applying his newly-discovered preparation, of which the following is a correct translation: Take half a peck of common salt, roast it in a pan till it ceases to crackle; then put it in an old iron pot over a fire sufficiently strong to reduce it to a glowing and shining state, like a melted metal; when it should be poured into another vessel for cooling. Thus it will form a hard stony mass, which must be broken into fragments, and immediately dissolve in three large pailfuls of boiling liquor from farm-yards, before the former has attracted any moisture. When it is completely incorporated, the whole is removed from the fire, and well mixed in a trough, with six pailfuls of good moor earth taken from ponds, or of the richest mire collected under dunghills. Having prepared this mixture, it will be necessary to add such a proportion of wood-ashes as is required to convert the whole fluid mass into a thick paste. In order to conclude the process, two bushels of fresh unslacked lime should be procured, and disposed of in this manner: first, it will be necessary to make a hole in the ground for a reservoir, which ought to be capacious enough to hold all the ingredients; and, the sides of which are to be *lined* with bricks or stone-work, so as to be perfectly tight. A layer of the above described composition is now spread on the bottom of this subterraneous magazine, and immediately over it, a thin stratum of coarsely pounded lime-stone; then again a similar portion of the former, and another of the latter, alternately, till the whole is properly arranged. This management, however, ought to be undertaken by *two* persons, and with the greatest expedition, to prevent both the fermentation of the materials from taking place too early, and the escape of the inflammable gas into the atmosphere: for the same reason, the surface of the compound, or the top of the reservoir, must be speedily covered with swards or turf, to exclude every access of air. After remaining at rest for a few days, the internal commotion and heat will cease; and the whole be reduced to a dry, fine powder, which is fit for immediate use..... Dr. BAHRENS directs such powder to be thinly strewed over the land, after the seed has been sown and once harrowed, so that it may be duly mingled with the soil by the subsequent operations of the harrow. He observes, from repeated experiments, that this compound has been productive of great advantage, not only to every species of grain and garden fruits, but also to meadows and pastures; the quantity above stated, being sufficient to manure a whole acre (consisting of 180 poles or rods square, decimal measure), which nearly agrees with our computation of English acres. And, if this artificial composition be applied for *two* successive years, its fertilizing properties continue undiminished for the *three* subsequent crops; so that the soil will thus be improved for *five* years, in a manner equal to that obtained from the richest dung. We confess our inexperience of the effects of this remarkable compost: but, as it has the sanction of a respectable authority, and is not at-

tended with any considerable expense (though the trouble of preparing it may, in this country, be a serious objection), we do not hesitate to recommend it to the attention of our practical agriculturists, whose skill and industry will doubtless enable them to overcome many obstacles.

MANUSCRIPT, signifies a book or paper written by hand, as opposed to those which are printed.

Having already pointed out, in the article DEED, the most easy method of restoring written characters that are almost obliterated. We shall at present state a simple contrivance by which, we believe, manuscripts may be rendered legible, though the letters be totally effaced. First, let the obliterated paper be slightly moistened with a sponge dipt in cold water, after which some galls finely levigated, are to be sifted over the paper..... When it is perfectly dry, the powder should be gently shaken off, or removed with a soft brush; thus, part of it will adhere to the former outlines that still exist in the paper, and the letters will immediately reappear.

[COUQUEBERT has communicated to the *Philomathic Society of Paris*, a very simple process for taking a copy of a recent manuscript. The process is the more interesting, as it requires neither machine nor preparation, and may be employed in any situation. It consists in putting a little sugar in common writing ink, and with this the writing is executed upon common paper, sized as usual. When a copy is required, unsized paper is taken, and lightly moistened with a sponge. The wet paper is then applied to the writing, and a flat iron, such as is used by laundresses (of a moderate heat), being lightly passed over the unsized paper, the copy is immediately produced.]

MAPLE-TREE, or *Acer*, L. a genus of plants, comprising twenty species.

1. The *campestris*, or COMMON MAPLE, which is a native of Britain, grows in thickets and hedges and flowers in the month of June. The wood of this species is much used by turners, being far superior to that of the beech. When it abounds with knots, it is greatly esteemed by joiners, for the purpose of inlaying. On account of its lightness, maple-wood is also frequently employed for musical instruments: being remarkably white, it was formerly converted into tables, and other articles of domestic furniture, particularly cups; which last may be turned so thin, as to transmit light. But, at present, this tree is principally planted for hedges, and for underwood; because it is of quick growth, and affords excellent fuel. According to DAMBOURNEY, a decoction of the bark of the common maple, imparts to wool, prepared in a solution of bismuth, a reddish-brown colour similar to that obtained from woad.

2. The *Pseudo-platanus*. See SYCAMORE-TREE.

[MARSHALL, in his *Arbustrum Americanum*, enumerates the following native species of maple,

1. *Acer Pennsylvanicum*, dwarf mountain maple. It grows on mountains, and rises to the height of six feet; the leaves are three pointed, pretty much sawed on their edges, and placed opposite on moderately long foot stalks.

2. *A. Glaucum*, Silver leaved maple, a tall spreading forest tree;

leaves five lobed, deeply and irregularly sawed on their edges; they are of a lucid green on the upper side, and of a bright silver colour on their under side. The flowers are produced in little umbels at the foot of the leaves, are of a deep red colour, and exhibit a fine appearance.

3. *A. Negundo.* Ash-leaved Maple. Rises to the height of twenty feet: the leaves resemble those of the ash, but are three or five lobed. The flowers of the male, are produced upon pendulous bundles of very long fine foot-stalks, each having a small flower cup at its extremity. The females produce flowers at the extremity of the small branches, in long loose bunches.

4. *A. Canadense.* Striped maple. Is of a middling growth. The bark is beautifully variegated or striped. The leaves are divided into three very sharp pointed lobes, and finely sawed on their edges. The flowers are produced in solitary bunches, with short foot-stalks, and are of a greenish yellow cast.

5. *A. Rubrum.* Scarlet maple. Grows to a large size. The leaves are three and sometimes nearly five lobed, and sawed on their edges. The flowers are produced in little umbels closely surrounding the small branches, and are of a scarlet colour, and exhibit a very fine appearance early in the Spring. There is a variety of this with yellowish flowers and seeds, which is the most common kind in Pennsylvania. The wood is much admired for cabinet work, the grain being curiously waved and curled, which when polished or varnished, is highly ornamental.

6. *A. Sacharinum.* Sugar maple. A very large tree. The leaves resemble the *silver-leaved maple*, but are not so large, nor deeply lobed; nor of so fine a silvery white. The flowers are of an herbaceous colour. The wood of this species is esteemed for making saddle-trees, and other mechanical purposes. This species yields a greater quantity of saccharine juice, when tapped in the Spring, than any of the species of maple. The best mode of making sugar from this juice, shall be fully described when we come to the article Sugar.]

MARANTA. See ARROW-ROOT.

MARBLE, in Natural History, a genus of stones that admit of a bright and beautiful polish: they are composed of small separate concretions, moderately hard; not emitting fire, when stricken against steel; effervescing with, and soluble in acids; and calcining in a moderate fire.

The finest modern marbles are those of Italy, Blankenburg, France and Flanders. In some of the Western Islands of Scotland, very fine specimens of this fossil have lately been discovered. When chemically examined, marble consists of calcareous earth united with fixed air; and is, like limestone, or chalk, convertible into a strong quick-lime.....Black marble derives its colour from a partial admixture of iron.

Staining of Marble.....The pieces to be coloured should be of the hardest kind; previously well polished; and be divested of every spot or blemish. Such only are calculated for supporting the heat which is always necessary, in order to open their pores, and render them susceptible of the colours. On the other hand,

too low or too high a degree of heat are equally injurious: hence a due temperature ought to be preserved; and this, without making the marble red, will cause the liquor to boil on its surface.

The principal colours used for staining marble are, *red*, *yellow* and *blue*: the two first of these tints may be imparted to it, by reducing dragon's blood, or gamboge to a powder, and grinding them separately with spirit of wine in a glass mortar. But, in experiments on a small scale, a little of either of those powders should be mixed with spirit of wine in a silver spoon, and dissolved over a charcoal fire. Thus, a strong tincture will be extracted; with which, by the aid of a pencil, the finest traces may be drawn on marble, while cold: on heating the latter in an oven, the marks will penetrate deeply, and remain perfectly distinct.

A fine *blue* colour may be communicated to marble, by a watery solution of the drug, known among dyers by the name of *Canary Turnsol*, and tracing the marks designed with a pencil. These will strike deeply into the stone, and the colour may be increased, by drawing the moistened pencil repeatedly over the same lines. The staining liquor must always be laid on *cold*; nor should the marble afterwards be heated; yet such blue is apt to spread itself irregularly, unless its outlines be circumscribed by wax, or other adhesive matter. This colour possesses the advantage of being applicable to marble that has already been stained with other drugs; it affords, besides, a very beautiful shade, and is not liable to be easily effaced.

In 1778, a patent was granted to Mr. Richter, for his invention of an art or method of inlaying *scagliola*, or plaster in marble or metals, so as to imitate flowers, fruits, trees, birds, beasts, landscapes, and every kind of ornament. This patent is now expired; but, as it is practicable only by statuaries and artists, the inquisitive reader will consult the 10th volume of the *Repertory of Arts and Manufactures*.

For the easiest method of cleaning marble, or alabaster, See p. of our first volume.

MARBLING the art of painting or disposing colours, in such a manner as to imitate marble.

There are several kinds of marbled paper, which vary only in the forms or figure of colouring: some are dotted; others drawn in irregular lines; but the method of tinging them, simply consists in dipping the paper in a thick solution of gum tragacanth, over which the colours are uniformly spread, after having been ground with ox-gall, and spirit of wine.

The paper must first be immersed in clear water, the sheets regularly folded over each other, and covered with a weight. It is now to be carefully laid on the colouring solution, and pressed softly with the hand, that it may bear equally on the whole. Next, it must be suspended in order to dry; and, as soon as the moisture is evaporated, the paper is polished by rubbing it with a little soap, and smoothing it either with glass highly burnished, or with a polished agate.

The colours usually employed for red, are, carmine, lake, or vermillion.....for yellow, Dutch-pink and yellow ochre....for blue, Prussian-blue and verditer....for green,

verdigrease, a mixture of Dutch-pink, and Prussian-blue, in various proportions....for orange, the orange lake, or a composition of vermillion, or read-lead, with Dutch-pink....and lastly, for purple, rose-pink and Prussian-blue.

These different colours are first to be finely triturated with spirit of wine, when a small proportion of gall is to be added, and the grinding of the whole repeated. The proper quantity of gall can be easily ascertained by comparative trials; because there must be only such a proportion of it used, as will suffer the spots of the various tinging matters to unite, when sprinkled on the solution of tragacanth, without intermixing, or running into each other. The whole being thus prepared, the solution is to be poured into different vessels, according to the colours employed, which are to be sprinkled on the surface; and the process of marbling is completed by laying the paper on the mixture, in the manner above directed.

MARE, the female of the horse kind.

Having already stated under the article HORSE, the proper management of mares, considered as beasts of labour, we shall at present give a few hints relative to their treatment, during the period of foaling.

Mares bring forth after a gestation of about eleven months. Before they are covered, it will be advisable to keep them in the stable for five or six weeks, during which time they ought to be fed with good hay, and sweet oats well sifted: in order to promote the object, about a quart of blood may be taken from each side of the neck, five or six days previously to their admission.

No mare intended for the stud should be less than six years old: the most proper period for accomplishing the purpose, appears to be in the beginning of June, so that she may foal in the succeeding month of May; when the meadows will abound with rich grass, which contributes to the abundant secretion of milk; but Mr. YOUNG (*Annals of Agriculture*, vol. 36) thinks it is more advantageous when they foal early, for instance, in February; or, which is perhaps still better, in January; though he assigns no reason for such opinion.

The management and diet of the animal should not be changed for three weeks or a month after covering; she ought likewise to be kept clean in the stable, and her feet should be well pared and thinly shod. To facilitate parturition, the animal's nostrils may be closed by hand, at the time of foaling; in order to prevent her from inhaling the air; and, if such expedient be ineffectual, a pint of warm ale should be given her, with a small quantity of madder. If the mare be deficient in milk, it has been directed to boil as much as can be drawn from her, together with lavender leaves, and to foment the udder with this decoction while warm, till the knotty tumours that prevent the milk from flowing, be discussed. Her drink ought now, for the space of a month, to consist only of *white water*, that is, bran and water stirred together, till the liquor appear white. At the end of that period, a decoction of sulphur and savin should be given to the animal, which, as well as the colt, will thus be greatly invigorated.....See also COLT.

MARE'S-TAIL, the Common, or *Hippuris vulgaris*, L. an indigenous perennial plant, growing in ditches and stagnant waters; it flowers in the month of May.

This weakly astringent vegetable is eaten by goats, but refused by cows, sheep, horses, and swine. Its rough stalks are employed by cabinet-makers and turners, for polishing wood, bones, brass, &c.

MARINE ACID....See spirit of SALT.

MARJORAM, or *Origanum*, L. a genus of perennial plants, comprising 14 species: of these, one only is indigenous, viz. the *vulgare*, COMMON, WILD, or FIELD MARJORAM, which grows in thickets and hedges, it flowers in the months of July and August.

This plant delights in a calcareous soil, and is easily propagated either by its seed, or by slips of the roots. It is a fragrant aromatic, has a pungent, spicy taste, and is much esteemed for culinary purposes; especially for imparting a fine flavour to broths. The dried leaves are uncommonly grateful, and are sometimes used as a substitute for tea. An essential, but extremely acrid, oil is expressed from this herb, and which is often employed by farriers as a *caustic*. If a little cotton, wool, moistened with such oil, be introduced into the hollow of an aching tooth, it frequently tends to relieve the pain. The whole plant excepting the root, when boiled in water, imparts a bright red and deep brown colour to wool, especially if the latter be frequently taken out of the liquor, and properly beaten. But, if linen is to be dyed of a purple colour, it ought to be previously steeped in alum water, then immersed for 48 hours in a decoction made of the bark of the crab-tree. In Germany, the dried herb is occasionally suspended in a cask of beer, with a view to correct its tart or acid taste. Goats and sheep eat its leaves and stalks; but they are not relished by horses; and totally refused by cows.

MARKET, a public place in a city or town, where live cattle, provisions, or other commodities are exposed to sale....See FAIR.

MARLE, a kind of calcareous earth, which is often and advantageously employed as a manure. It is found in various parts of Britain, and generally lies at the bottom of low bogs.

Marle is divided into three species; calcareous, argillaceous, and siliceous or sandy; all of which are composed of chalk and clay, so as to crumble with greater or less facility, on being exposed to the atmosphere. They are of a soft, unctuous nature, and dissolve speedily after rain: when dry, they slacken in the same manner as lime, and are at length converted into a very fine powder. Their quality varies according to the soil under which they are deposited: the Norfolk marle is held in the greatest esteem; but the most valuable is that found near the sea, or large rivers.

1. *Calcareous Marle* is, in general, of a yellowish-white or yellowish-grey colour, but in some places of a brown or red cast. It is commonly discovered a few feet beneath the surface of the soil, and on the sides of hills, or on the banks of rivers flowing through calcareous countries. This species of marle is mostly of a loose

texture; and, though sometimes moderately coherent, yet it seldom possesses a stony hardness, in which state it is called *stone-marle*. When it is so thin as to be called *paper-marle*, it is frequently mixed with shells; on which account it is called *shell-marle*, and is reputed to be the best sort. It effervesces with acids: when pulverized, it feels dry between the fingers; and, if immersed in water, it readily crumbles to pieces; but does not form a viscid mass.

2. *Argillaceous marle* is of a grey, brown, or reddish-brown colour; being harder, and more unctuous, than the former species, and adhering to the tongue. It effervesces with aqua fortis, or spirit of salt, but not with vinegar: in water, it dissolves more slowly; and, if it be exposed either to air or moisture, it does not moulder so quickly as the calcareous kind.

3. *Siliceous* or sandy *Marle*, contains a greater proportion of sand, than of chalk or clay. This species is of a brownish-grey or lead colour; it is, in general, friable and *flaky*, but sometimes forms very hard lumps. It effervesces with acids but neither dissolves in water, nor moulders so speedily as either of the two former kinds. Marle affords an excellent manure for sandy, dry, gravelly, or light lands of any kind; it likewise produces very beneficial effects on mossy and clayey soils; provided a due proportion be applied, and afterwards perfectly dissolved.

[The ingredient of marles, on which their fitness for agricultural purposes depends, is the *carbonate of lime*. It is owing to the presence of this earth, that marles effervesce on the addition of acids, which is one of their distinguishing characters. In ascertaining whether an effervescence takes place, let the marle be put into a glass partly filled with water, which will expel a portion of air contained mechanically in the marle, and thus obviate one source of fallacy. When the marle is thoroughly penetrated by the water, add a little muriatic acid, (spirit of salt). If a discharge of air should ensue, the marley nature of the earth is sufficiently established.

To find the composition of a marle, pour a few ounces of diluted muriatic acid into a Florence flask; place them in a scale, and let them be balanced: then reduce a few ounces of dry marle into powder; and let this powder be carefully and gradually thrown into the flask, until after repeated additions, no further effervescence is perceived. Let the remainder of the powdered marle be weighed; by which, the quantity projected will be known. Let the balance be then restored. The difference of weight, between the quantity projected, and that requisite to restore the balance, will shew the weight of air lost during effervescence. If the loss amount to 13 per cent. of the quantity of marle projected, or from 13 to 32 per cent. the marle assayed is calcareous marle, or marle rich in calcareous earth. Clayey marles, or those in which the argillaceous ingredient prevails, lose only 8 or 10 per cent. of their weight by this treatment; and sandy marles about the same proportion. The presence of much argillaceous earth may be judged by drying the marle, after being washed with spirit of salt, when it will harden and form a brick.

To determine, with still greater precision, the quantity of calcare-

ous earth in marle, let the solution in muriatic acid be filtered and mixed with a solution of carbonate of pot-ash, till no further precipitation appear. Let the sediment subside; wash it well with water; lay it on a filter, previously weighed; and dry it. The weight of the dry mass will shew how much carbonate of lime, the quantity of marle, submitted to experiment, contained. See KIRWAN on MANURES]

The quantity necessary to be used, varies according to the nature of the soil; but the utmost caution is requisite; because, if too large a portion be scattered on the land, it cannot be easily removed; and, if too little be employed, the deficiency may be readily supplied.... On sandy, gravelly, or light soils, it will be advisable to spread as much as will form a thick coat, in order to bind and stiffen the ground. But, of whatever nature the land may be, the most judicious cultivators recommend such a portion to be laid on it, as will form a thin coat over the whole surface.

The proper season for *marling*, is the summer; as this kind of manure is then perfectly dry, and not only lighter, but also more easily reduced to powder. Marle, however, may be advantageously spread during the winter-frosts; as in the latter season, there are few opportunities of performing other labours of the field.

Previously to marling, the land ought to be diligently cleared from all weeds, and rendered level, both with the brake and the common harrow, so that the marle may be equally spread on the surface; where it should be suffered to lie during the winter. In the month of February, and in dry weather, it will be proper to draw a bush-harrow, well weighted, over the land, that the marle may be uniformly distributed; but, as this manure is very ponderous, and sinks to the bottom of the furrow, if injudiciously ploughed in, it has been suggested to turn it into an *ebb-furrow* for the first crop: during the growth of the latter, the marle will incorporate with, and become a part of the soil, from which it does not readily separate. So permanent, indeed, are its fertilizing properties, that if land be properly marled, it will continue arable for the space of 12 or 14 years; and, for pasture, during a much longer period.

As marle affords so valuable a manure, it will be useful to point out a few characteristics, by which it may be distinguished from different substances that resemble it. For this purpose, a small mass or lump should be exposed to the air: if genuine, it will, in a short time, by the action of the dews, nitre, &c. crumble into small pieces; and there will likewise appear a hoary or whitish congelation on the side accessible to the rays of the sun.... Another method consists in reducing the marle, when dry, to small particles, which are to be thrown into a coal-fire; where, if it be native or pure, it will crackle in a manner similar to salt. But the most certain criterion is, to break a small piece of dry marle into a glass of pure water; in which, if the substance be of the genuine kind, it will speedily dissolve; forming a soft, almost impalpable paste, and throwing up many bubbles or sparkles to the surface of the water. The experiment may be repeated with vinegar, in which fluid the effervescence will be con-

siderably stronger: in both cases, however, it will be necessary to keep the glass steady; as otherwise, if it be agitated, the intestine motion cannot be distinctly observed.

A good *artificial marle* may be prepared, by mixing equal quantities of pure clay and lime, in alternate layers, so as to form a heap, which should be exposed to the winter frost: this compound is well calculated for light lands; but, if the soil be strong and heavy, it will be necessary to substitute loam and sand for the clay....Such compositions may be usefully employed, where marle is not easily procured; as they will amply repay the labour bestowed on mixing them, being little inferior to the genuine calcareous earth.

MARL-GRASS. See CLOVER, the Common.

MARRIAGE, a contract both civil and religious between a man and a woman, by which they engage to live together in mutual friendship, and love, during the remainder of their days.

Matrimony has been instituted among all enlightened nations, for the wisest of purposes; and, as the contract continues in force for life, such partner ought to be chosen with the utmost circumspection.....If this circumstance were always duly weighed, there would certainly be fewer of those unnatural marriages, in which blooming youth is united to the aged or decrepid.

One of the most important points that merits constant atttention, is the *healthiness* of the parties..... Those who are the obvious victims of hereditary disease, ought, in conformity to every principle of justice and of reason, to be suspended from the connubial rites. Similar limitations should be observed with respect to the union of deformed persons, especially females, for whom a state of celibacy is doubtless more eligible; unless it appear, from proper inquiry, that notwithstanding their external deformity, they are fully competent to discharge the dignified maternal duties. Farther, an equality in point of natural disposition, temporal fortune, and of age, in both parties, should, as far as possible, regulate the choice....In the latter respect, the most proper period in general appears to be (in temperate climates) between the age of 18 and 20 in the female, and from 22 to 24 in the male sex.

MARROW, in animal economy, an oily matter secreted by the arteries of the internal membrane, which covers the bones. Its particular use, to the living body, has not hitherto been clearly ascertained; though it is probably of the same service to the bones, as fat is to the soft parts; namely, to render their fibres less brittle, by its lubricating property.

With regard to its medicinal effects, marrow is doubtless more subtle, and penetrating than any other animal fat; and ought therefore to be eaten with great caution. As it is much relished by epicures, it will be proper to observe, that marrow is with difficulty digested, unless thinly spread on toasted bread, with the addition of salt, and used with moderation. We believe, however, that it might with more advantage and propriety be employed for liniments and ointments prepared for immediate application; because it will, in this respect, be found superior to hog's-lard, though it more speedily turns rancid.

MARSH, signifies a tract of ground partly covered with water, yet so as to permit grass or other vegetables to rise above its surface: these, while gradually decaying, occasion putrid exhalations, which are extremely pernicious to the health of mankind.

Marsh-lands are chiefly employed for the grazing of cattle, which, in such pastures, fatten speedily; nay, it is by some writers, though we believe, erroneously, asserted, that sheep feeding on them, are preserved from the rot. Without attempting to decide this question, we shall observe, that it will be advisable to raise a bank, and plant it with trees, if possible, in the midst of the marsh, either crosswise, or in a semi-circle: they would afford a shelter for the cattle, and in a few years repay the expense of forming the plantation. If the soil be situated near the sea, it will also be requisite to form ponds or reservoirs for the reception of the rain, in order that the sheep, &c. may at all times be furnished with sweet water. Such fence or trees will, at the same time, serve to intercept the sea-breezes, which often *nip* the tops of the grass, if unsheltered from their influence.

In order to convert a marsh into firm or arable land, it should first be drained, in the manner described in article DRAIN. Its various parts ought next to be wholly changed: 1. By frequent ploughing, harrowing, and burning; 2. By the addition of marle, clay, gravel, or other heavy substances; 3. By such matters as act chemically upon the soil, and bring its latent principles into action; for instance, lime, chalk, alkaline salts, &c.; 4. By spreading those manures which have a large proportion of fat, or mucilage; such as putrid fish, sea-weed, stable-dung, &c.; because marsh-lands rarely contain any animal substances, which are, in a great measure, the chief constituent parts of a rich soil. Lastly, by compression, either by the treading of cattle, or by the use of rolling-carts, and similar heavy implements.

Where marshy situations are too extensive to render them completely dry, they ought to be constantly flooded, by means of dams and sluices, to prevent the effects of putrefaction. Lastly, to obviate still farther the pernicious consequences of residing near marshes or mill-ponds, it will be useful to plant between those waters and the dwelling-house, rows of such trees as vegetate rapidly, and retain their verdure to a late period of the year, so that the humid vapours may be intercepted, while such vegetables furnish a constant supply of oxygen to the atmosphere.

MARSH-LOCKS, the PURPLE, or MARSH CINQUEFOIL, *Comarum palustre*, L. an indigenous perennial plant, growing in muddy and putrid marshes; flowering in the months of June or July; and producing red berries in autumn..... The whole plant may be usefully employed in tanning calf-skins.... The Irish, who dispose of milk in the streets, rub the inside of their pails with this herb; in consequence of which the milk appears to be thicker and richer.....The roots of the marsh-locks produce in dyeing an indifferent-red colour .....Goats eat the plant, but it is not relished by either cows or sheep, and totally refused by horses and hogs.

MARSH-MALLOW, or *Althæa officinalis*, L. an indigenous

perennial plant, growing in salt-marshes and on the banks of rivers; flowering in the month of August.

This useful plant may be easily propagated, either by parting the roots in autumn, when the stalks decay; or by sowing the seeds in the spring. It delights in a moist soil, where it will grow to a considerable size; and thrives well, when transplanted, in any soil or situation.....Bees are remarkably fond of its melliferous flowers.

Every part of the Marsh-mallow, and especially the root, on boiling it, yields a copious mucilage; on account of which, it is frequently employed in emollient cataplasms, and by way of infusion. In humid asthma, hoarsness, dysenteries and likewise in nephritic and calculous complaints, it is of eminent service; as, by lubricating and relaxing the vessels, it procures a more easy passage to the stagnant fluids. It is with equal advantage applied externally, for softening and maturating hard tumors; and when chewed, it is said to afford relief in difficult teething.....The *Syrup of Marsh-mallows*, sold in the shops, is prepared from the roots, and chiefly used for sweetening emollient decoctions.

MARSH-MARIGOLD, or MEADOW-BOUTS; *Caltha palustris*, L. an indigenous perennial plant, thriving in moist meadows, and on the banks of rivers: it flowers in the months of April and May.

This hardy vegetable preserves its verdure during the winter:.... hence, its cultivation has been recommended by DU HAMEL, as an excellent winter pasture for cattle. ....It may be easily propagated either by parting the roots in autumn, or by sowing its seeds about the latter end of the summer: it requires a humid soil, and a shady situation. When gathered before they expand, the flowers, if preserved in vinegar with the addition of salt, may be used as a substitute for capers. The juice of the petals, boiled with a little alum, communicates to paper a yellow colour; and it may likewise be employed in the spring, for imparting a similar tinge to butter....Although BOERHAAVE informs us that cows will not touch this plant, unless impelled by hunger, when it produces a fatal inflammation; yet we believe with DU HAMEL and BECHSTEIN, that cattle may eat it with safety; as they instinctively devour its bitter leaves..... Goats and sheep also relish the Marsh-marigold; but horses and swine refuse it.

MARTIN, or *Hirundo urbica*, L. a well known bird of passage, which makes its annual appearance in Britain, from the beginning of April to the middle of May, according to the state of the weather....See SWALLOW.

MARTIN, the COMMON, or *Mustela foina*, L. an animal of prey, which inhabits Britain, Germany, France, and the South of Europe. It is a most elegant and lively quadruped, its motions being exceedingly nimble. The female breeds in hollow trees, and produces, while young, three or four; but, when several years old, frequently six or seven martins at a litter; which, in winter, have sometimes been found deposited in the nests of magpies.

These animals are very destructive to poultry, eggs, &c. in farm-yards. With a view to obtain access to pigeon-houses, or hen-

roosts, they climb rough walls with facility. As they are remarkably fond of honey and hemp-seed, they might be thus easily entrapped:.... their skin and excrements emit a musky odour.

Martins are tamed with great difficulty, never forming any attachment, so that they must always be chained. Nevertheless, if properly secured, they are very useful in farm-yards, for destroying rats, mice, &c.

We are not acquainted with a better method of exterminating these depredators, than by smothering them in their recesses with the smoke of sulphur.

MARYGOLD, the TRIFID BUR, TRIFID DOUBLE-TOOTH, WATER-HEMP, or HEMP-AGRIMONY; *Bidens tripartita*, L. an indigenous annual plant, growing in marshy and watery places, and flowering in the months of August and September....DAMBOURNEY and other writers inform us, that both the fresh and dryed herb imparts to wool, with the addition of alum, a very bright yellow colour: the yarn or cloth, however, should be washed and dried before it is immersed in the dyeing liquor, in which it ought to be boiled for two hours; and, in order to extract more effectually the colouring particles, the plant must be cut in small pieces, put in the vessel, in alternate layers with the substances to be tinged, and properly agitated.

There is another species, namely, the *Bidens cernua*, or NODDING MARYGOLD, which is possessed of similar properties.

MARYGOLD the CORN. See Great White Ox-eye.

MASH, a drink given to horses. It is prepared by infusing half a peck of ground malt in a sufficient quantity of boiling water, then agitating the liquor, till it acquires a sweet taste, and when lukewarm, administering it to the animal.

This preparation is used generally after a purge, in order to promote its operation; and, after hard work; or, as a substitute for drink, when a horse labours under depressing sickness.

[MASHING MACHINE. The late WILLIAM ELLIS, of New-Jersey, obtained a patent from the United States for a machine to mash malt, which is thus described in the specification.

"The principal parts of this machine consist of two horizontal rollers, one above the other, which move on pivots in the extremities of two perpendicular bars; round the rollers move one or more bands, having rakes fastened to them, which by the turning of the bands move upwards and downwards, thereby mashing the malt. One of the perpendicular bars moves on a pivot in the centre of the malt tub, and receives its motion from a cog wheel at the extremity of the upper roller, moving in a double cog wheel, above the centre of which, is the perpendicular bar in the middle of the tub, the upper cogs of the last mentioned wheel move in cogs at the extremity of the shaft which receives its motion from a horse or other power."

A machine made upon the above principles, was put up in the brew-house of J. W. MORRIS in Philadelphia, and highly approved of. Unfortunately however, the patentee did not proportion the strength of the parts to the power applied, and hence the machine after being in use a short time gave way;

and as the repairs would have amounted to as much as the cost of a new machine, it was not deemed expedient to repeat the experiment.

The death of the patentee has prevented the trial of the machine by others.]

MASTERWORT, the Common, or *Imperatoria Ostruthium*, L. is an indigenous, perennial plant growing in damp meadows, and flowering in the month of June. It is cultivated in gardens, on account of its medicinal properties, and may be propagated either by sowing the seed, or by parting the roots in autumn.

Masterwort produces a warm and aromatic root, which has been recommended in the dropsy; as well as in debility of the stomach and bowels. An infusion of it in wine is said to have cured quartan agues, after the bark had failed..... When chewed, it produces a copious flow of saliva, excites a heating but agreeable sensation in the gums; and frequently affords relief in the rheumatic tooth-ach..... Hoffman asserts that the roots of this vegetable are of great efficacy in flatulencies, and the painful colics thence arising: when dried and pulverized, they have sometimes afforded relief in asthmatic cases, and disorders of the head. Boiled in a recent state with lard, they form an ointment, that is reputed to be of considerable efficacy in removing ring-worms.... According to Bautsch, it has also been advantageously employed in tanning.

MASTIC, or Mastich, the Syrian Herb, or Marum Germander, *Teucrium Marum*, L. a native of warm climates, and which we have incidentally mentioned, under Germander. Its leaves, distilled with water, yield a very acrid and penetrating essential oil, which resembles that obtained from scurvy-grass. And, though the plant is at present chiefly employed as a cephalic, there is reason to believe that it possesses very powerful diuretic and antiscorbutic virtues. Hence, Dr. Gleditsch strongly recommends an infusion of the leaves in wine properly digested, or a tincture prepared in proof-spirit, in diseases arising from relaxation of the solids, or a redundancy of viscid humours, such as lethargy, humid asthma, obstructions of the intestines, green sickness, swelling of the limbs, and the true scurvy. Being, however, an active medicine, the doses ought at first to be small, and but gradually increased; for instance, from one to three table-spoonfuls of the vinous infusion; or an equal number of tea-spoonfuls of the spirituous tincture should be taken, three or four times in a day.

MASTICATION, the act of chewing or grinding the solid parts of food between the teeth, by the united motion of the jaws, tongue, and lips; in consequence of which it is broken into small pieces, mixed with the saliva, and thus adapted for deglutition, as well as a more easy digestion.

This process in the animal economy is so essential to the prosperity of the individual, that those who are unfortunately deprived of their teeth, seldom enjoy a good state of health. Being unable to masticate *solid* food, they have recourse to rich soups, broths, jellies, &c. all of which require not only vigorous organs of digestion, but likewise a proper share of ex-

ercise; both conditions rarely concur in favour of the aged or decrepid, so that their fluids become gradually tainted with an unnatural acrimony; a disposition to a full habit or plethora is often induced; or the constitution is otherwise impaired. Hence also the absurdity of suffering nurses (who are perhaps the masked victims of disease) to chew the victuals of healthy and uncontaminated infants.... It is equally pernicious to swallow solid food at meals, in so expeditious a manner as to allow no time for proper mastication. Many persons thus ignorantly lay the foundation of a foul and disordered stomach: the consequences of which are frequent eructations, flatulency, colic, &c. Every particle of animal or vegetable aliment which is eaten in an unmasticated state, requires at least *double* effort of the digestive organs, and is not productive of *half* the nutriment which it would otherwise afford.... Daily experience amply corroborates this assertion, especially in the articles of *boiled* animal food, carrots, cucumbers, &c. if hastily consumed. Lastly, there is a degree of brutality in *fast eating*, which is highly reprehensible; besides, the injury thus occasioned to the individual cannot be easily repaired.

MASTICH, a resinous substance exuding from the mastich-tree, or *Pistacia lentiscus*, L. a native of the southern parts of Europe. The best is imported from Chios, in the Levant, in small transparent grains, of a yellowish colour, and an agreeable smell, when heated over the fire.

This resin is recommended in obstinate coughs; dysenteries; weakness of the stomach; and in all cases of debility and laxity of the fibres. For such purposes, it is dissolved in rectified spirit of wine, and may be taken in doses of thirty or forty drops diluted with water, every three hours, or oftener.

MASTICOT, or YELLOW-LEAD, is the calx or ashes of lead, obtained by slow calcination, in consequence of which that metal acquires a lighter or deeper yellow colour, according to the degree of heat. It is sometimes used by painters; but is also employed medicinally, as a drying powder, in the composition of ointments or plasters. See LEAD.

MASTIFF, *Canis villaticus*, *v. catenarius*, L. a valuable species of the dog-kind.

This bold animal is alike remarkable for his loud voice in barking, his extraordinary size, and surprising strength. So great indeed is their courage and muscular power, that three of these quadrupeds are more than adequate to cope with a lion.

The mastiff is particularly valuable as a vigilant house-dog, and it is much to be regretted, that this species of useful creatures has, within a few years, rapidly declined in numbers. For the most proper method of managing dogs, in general, the reader is referred to that article.

MATCHING, a method of preparing vessels for the preservation of wines, cyder, or similar liquors, from becoming sour. It is effected in the following manner: Let any quantity of sulphur be melted in an iron ladle: and, as soon as it is liquified, slips of coarse linen cloth are to be dipped in it; which, when taken out and cooled, are called *matches*. One of these slips is

now to be lighted, and suspended in the bung-hole of a cask, which ought to be slightly stopped, till the *match* is consumed; when the hole may be closed, and the vessel be suffered to stand for one or two hours. On opening the bung-hole, it will be found that the sulphur has communicated to the whole cask a very pungent, though suffocating and acid, odour.

The vessel may next be filled with small wine, newly fermented; and, on carefully closing it, the liquor will speedily clarify. This method is very commonly practised in different parts of England, and is said to be very useful; as many poor wines may thus be preserved potable for a considerable time. We doubt, however, its salubrity; and conceive that other articles might be advantageously employed instead of the pernicious fumes of sulphur, which render both wine and cyder alike unwholesome, especially for persons affected with diseases of the breast or lungs.

MATWEED, the SEA, HELME, SEA-REED, or MARRAM, *Arundo arenaria*, L. an indigenous perennial plant, growing only on the driest sandy shores, and flowering in the month of June or July. This useful reed prevents the wind from dispersing the sand over the contiguous fields, which, by neglecting its propagation by seed, are not unfrequently rendered useless. The Dutch have availed themselves of this advantage; and, for the same reason Queen ELIZABETH wisely prohibited the extirpation of this beneficial vegetable. It is at present cultivated on the Norfolk coast, with a view to prevent the irruption of the sea: the inhabitants of Newborough, in the Isle of Anglesea, manufacture it into mats and ropes, whence they obtain their chief support..... In Denmark, the fibrous roots of the Sea Matweed are employed for making whisk-brushes; and the Icelanders collect and dry the seeds; from which, after reducing them to powder, a palatable bread is prepared, resembling in taste the meal of malt.

MATWEED, the SMALL, HEATH-MATWEED, or MAT-GRASS, *Nardus Stricta*, L. an indigenous perennial plant, growing on moist heaths and marshes; flowering from June to August....It is eaten by horses and goats, but disliked by cows and sheep.

This species is often a troublesome weed, as well on arable lands as on pastures, where it affords but coarse food to cattle: as it, however, forms large and thick tufts, which resists the action of the scythe, it may be usefully transplanted to loose sandy lands: in such situations, its spreading horizontal roots greatly tend to consolidate the soil, and increase the stratum of vegetable mould, for the reception of more useful plants....BECHSTEIN remarks, that it would be advisable to propagate the Small Matweed in young plantations exposed to cold and bleak winds; on account of the protection it might afford to tender trees.

MAYWEED. See Fetid CAMOMILE.

[MAZAGAN BEAN, was noticed under the article BEAN. The following directions to raise them early in summer, are given by RICHARD WESTON, of Leicester... See *Rep. Arts. new series*, vol. i.

"Plant Mazagan beans in October, on a south border, close to the wall, three inches asunder, in

two or three rows. In frosty weather, cover them with long litter. Transplant them at spring, leaving the strongest at five or six inches distance."]

MAZE, or LABYRINTH, in Gardening, denotes a piece of ground, planted and arranged in various meanders, so as to render it difficult, after entering the walks, to find the leading avenue.

Labyrinths contribute equally to health and amusement; and, as few persons possess gardens or pleasure-grounds sufficiently extensive for long-walks, we have subjoined an outline of a maze, in which simplicity and economy are strictly combined.

The principal expence of such a maze, will be the green hedges, which ought to be seven feet high; and, if the breadth of the walks be calculated at four feet, besides 12 inches for the room occupied by the shrubs, the diameter of the whole will not exceed 150 feet..... In the centre might be planted a lofty chesnut or other tree, with spreading branches; or a circle of poplar-trees, the height and sprightliness of which invite the wanderer to refresh himself under their cooling shade.

It should be remarked, that the plan, as appears from the preceding cut, represents only regular interwinded walks which, by various circumvolutions, lead exactly to the central spot of ground..... But, if it be designed to establish a real *labyrinth*, on a larger scale, the hedges ought in various directions to be interrupted; for instance, at the points marked with

the letters A, and B, in order that those who mistake the true path, might inadvertently return to the avenue whence they came.

Lastly, a maze should, if possible, be so situated, that it may be viewed from the windows of a house, or an elevated spot, in its vicinity. Thus, it will afford an interesting spectacle to persons of the most opposite disposition of mind: the gay and cheerful will delight in beholding others perplexed in the pursuit of the central spot; while the grave and reflecting have an opportunity of viewing, as in a mirror, a picture of active life, where man often seems to deviate from the true path, which nevertheless conducts him the nearest way to the end of his journey: while others, though sometimes very nigh the desired object, in a manner blindfold pass by, and with every step advance on the contrary road!

MAZZARDS. See Common Wild CHERRY-TREE.

MEAD, an agreeable liquor prepared of honey and water, with the addition of spices.

Various methods are practised in the brewing of mead; which, however, do not essentially differ from each other: the following is one of the most approved:.....Let the whites of six eggs be well incorporated with twelve gallons of water, to which twenty pounds of honey are to be added. The ingredients should boil for the space of one hour; when a little ginger, cloves, cinnamon, and mace, together with a small sprig of rosemary, are to be put into the liquor. As soon as it is cool, a spoonful of yeast ought to be added, and the mead poured into a vessel which should be filled up, while it *works*. When the fermentation ceases, the cask ought to be closed, and deposited for the space of six or eight months in a vault, or cellar, of an equal temperature, and in which the liquor is not liable to be affected by the changes of the weather. At the end of that period, it may be bottled, and is then fit for use.

A more simple, and, to some palates, more agreeable method is, to mix the honey in the proportion of one pound to a quart of water, which is to be boiled, scummed, and fermented in the usual manner, without the addition of any aromatic substances. It ought to be preserved in a similar manner, and bottled at the expiration of the same period of time.

[The following receipt is recommended by the same correspondent who furnished that for the currant wine.

To 30 gallons of water, add 90 pounds of pure honey, boil and skim, put the liquor into a large open tub, and add two ounces of bruised ginger-root, half an ounce of cinnamon, the same quantity of pimento; let the whole stand until of a proper temperature, then add yeast as in *currant wine*, flavour and barrel it up for use, as there directed.]

Mead was formerly the favourite liquor of the ancient Britons, and Anglo-Saxons. It still retains its place at country seats in the western parts of this island; where considerable quantities are brewed annually. Being an wholesome and pleasant beverage, it is far preferable to brandy, gin, or other pernicious spirits; though it does not always agree with the bilious, asthmatic, or those whose breast and lungs are in the least affected.

But if it be kept for a number of years in proper vessels, and dry cellars, it acquires a flavour and strength equal to the best Madeira or even Tokay wines : in this state, mead is a true medicine to the aged and infirm, when used with moderation.

MEADOW, generally signifies pasture, or grass land, that is annually mown for hay ; but it more particularly denotes such tracts of ground as are too low, and too moist for cattle to graze on them, during the winter, without injuring the sward.

The best lands for meadow are those situated on a gentle declivity, so as to be irrigated at pleasure, and which at the same time possesses a rich soil and moist bottom, especially if it be in the vicinity of a brook, or small running stream....See IRRIGATION.

Great Britain and Ireland are reputed to possess the most verdant pastures, and the finest natural grasses, in the vegetable creation : these advantages, however, do not appear to meet with that attention which they deserve..... Lately, indeed, the cultivation of grasses has been a favourite pursuit among experimental farmers and freeholders ; but, as the tenantry, in general, are bound to follow a certain rotation of crops, without having the power of breaking up old and unproductive meadows, *extensive* improvements cannot be expected, while such limitations prevail....We have cursorily mentioned these obstacles to national prosperity ; because they would require a more ample investigation than is compatible with our limits.

The first requisite towards obtaining a good meadow is, a perfect acquaintance with the best natural grasses, their peculiar soils, and the best mode of collecting their seeds : the most valuable are those of the northern and eastern parts of England. But, as comparatively few have an opportunity of procuring such seeds, the only method that can be pursued with hopes of success, appears to be that of selecting those grasses, which thrive luxuriantly on a similar soil ; and to gather the ripe seed from a productive old meadow.

On lands intended for pasture, and especially for sheep, it is advisable to sow *three* kinds of vegetables, with a view to gain the advantage of successive growth. Thus, Mr. PARKINSON sows four bushels of the seed of rye-grass, or red darnel (*Lolium perenne*, L.) ; 10 *lbs.* of trefoil seed (more properly common clover, *Trifolium pratense*, L.) ; and a similar quantity of white clover (*T. repens*, L.) He is of opinion that the ray-grass should be grazed early, while the white clover is still concealed in the ground, and the trefoil, or common clover, is just appearing ; that, when the darnel is eaten down, the common clover will spring up, and afford excellent food for sheep ; after which the white clover will appear : and, when the latter is consumed, the ray-grass again grows, and supplies pasturage during the winter months, if the weather prove tolerably mild. Hence this truly "experienced farmer" maintains, that one-third more in number of sheep, at least, may be thus supported than by any other method.

In order to form a meadow, far superior to the generality of artificial pastures, Mr. CURTIS recom-

mends six kinds of grass, and two of clover, to be sown broad-cast. The seeds are to be mixed together in the following proportions, viz.

Meadow Fescue-grass: *Festuca pratensis*, - -	4 parts
Meadow Fox-tail-grass: *Alopecurus pratensis*, -	4
Smooth Stalked Meadow-grass: *Poa pratensis*, -	2
Roughish Meadow-grass: *Poa trivialis*, - -	2
Crested Dog's-tail-grass: *Cynosurus Cristatus*, -	1
Sweet-scented Spring-grass: *Anthoxanthum odoratum*,	1
White or Dutch Clover: *Trifolium repens*, - -	2
Common or Red Clover: *Trifolium pratense*, -	2

These are to be mixed together, and about three bushels of them sown on an acre, in rows, so that they may be more conveniently hoed; in consequence of which they will vegetate with greater luxuriance. Towards the end of August, or early in September, it will be necessary to weed and *thin* the grasses occasionally, and also to roll them in the spring; an operation by which such roots as may have been raised by the frost, will be pressed into the ground. Mr. Curtis is farther of opinion, that the meadow fox-tail, and roughish meadow grasses, are best adapted to moist soils; the smooth-stalked meadow and crested dog's-tail, to dry pastures; and lastly, that the meadow-fescue and sweet-scented spring grasses will suit land, which is either moist or moderately dry.

If the soil be previously cleared from all noxious weeds and plants, the above-specified combination of grasses will, in the course of two years, form a most excellent meadow. But, in case it be required to *seed* a piece of land immediately, and the valuable grasses before mentioned cannot be procured, it has been recommended ("*New Farmer's Calendar*," p. 440, 2d edit. 8vo. Symonds, &c. 1801) to sow the following seeds, which are easily attainable; viz. Broad clover (a variety of the common clover), or cow-grass; white clover, trefoil, ray-grass, and, if the soil be sufficiently dry, burnet. On clean tilth, they will, in a few years, present a good meadow; as the clover and ray-grass, in the first or second year, produce an ample swathe for mowing: next, they will be succeeded by a luxuriant crop of the white clover and trefoil, united with the natural grasses of the soil.

Grass-seeds ought to be sown during moist weather, either in the summer or in autumn, after turnips, cabbages, or any other hoeing crop; for it is absolutely necessary to prepare for them a fine and clean tilth. On the approach of winter, the young crop should be slightly covered with long stable-dung, old thatch, or even sand, earth, or any other manure. The land ought, likewise, to be occasionally cleared of the weeds, together with their roots, and the vacant spots fresh *seeded*.

In laying lands down for meadows, old turf must be uniformly broken up, by paring and burning, when it is to be sown with new grasses; but, such soils as have been completely exhausted by successive crops of corn, should first be laid dry and diligently cleaned;

then sown with proper herbage, *top-dressed*, and manured for the space of two or three years; in consequence of which they will recover their former fertility.

Lastly, the operation of rolling meadows in the spring, especially such as have been irrigated, ought never to be omitted. The most proper time for this purpose is the beginning or middle of February, after the land has been laid dry for a week. Rolling prepares the grass for being cut close to the surface, when mown; which is a circumstance of considerable importance; because the ant-hills, and other little elevations, are thus pressed closely to the ground, and many inconveniencies will be thereby effectually removed.

MEADOW-GRASS, or *Poa*, L. a genus of plants, comprising 53 species, 16 of which are natives of Britain: the principal of these are:

1. The *aquatica*, or REED MEADOW-GRASS, growing in marshes and on the banks of rivers, flowering in the months of July and August. This species is uncommonly valuable for being propagated on the banks of rivers or brooks, where it is devoured with great avidity by horses, cows, and sheep: but as it is apt to *blow* or distend the bowels of cattle, when eaten too largely, or when its panicles are burnt, these circumstances deserve some attention. It abounds particularly in the Isle of Ely, rising to the height of six feet, though usually mown when about four feet high: after being dried, it is bound up in sheaves, then formed into *ricks*, in which it undergoes a light degree of fermentation, to improve its sweetness for provender. In this state, it is provincially called *White-lead*, from its acquiring a white surface when dry: it is peculiarly useful for milch cows; but horses do not relish it, when thus prepared. The reed meadow-grass is one of those vegetables that deserves to be more generally known and cultivated; as it likewise affords, if properly dried, an excellent substitute for straw, in thatching.

2. The *pratensis*, or SMOOTH-STALKED MEADOW-GRASS, which grows on dry banks, and even on walls: it flowers in the months of May and June. This plant thrives better in dry than in moist situations, whence it retains its verdure during hot and dry seasons, longer than any other vegetable. Its root spreads along the ground almost as rapidly as the couch-grass, and is nearly as difficult to eradicate: it ought, therefore, to be introduced with great caution, where the pasturage is not intended to be permanent. Though eagerly eaten by cattle, and esteemed to be one of the best grasses for hay, its value decreases, as its quantity every year diminishes in dry soils; and it at length produces very indifferent crops. This diminution is occasioned by its roots *matting* together, and exhausting the land; which effects, however, may be prevented by manuring the soil, and are not so perceptible on moist grounds, where the plant will flourish, though not so luxuriantly as in dry situations.

3. The *annua*, ANNUAL MEADOW-GRASS, or Suffolk-grass, which grows on pastures, in paths, gravel-walks, and the borders of fields; it flowers during the whole summer. This grass is devoured with avidity by every kind of cattle; and as it abounds in the county of Suffolk, where the finest salt-butter

is prepared, Mr. STILLINGFLEET conceives it to be the best grass for milch-cows.

4. The *trivialis*, ROUGHISH MEADOW-GRASS; Bird-grass; Fowl-grass; or Fold-meadow-grass. It is perennial, grows in moors, moist pastures; and the sides of hedges; and flowers from June to September. This plant is reputed to be in every respect the first of British grasses; as the best meadows abound with it, and particularly the celebrated *Orcheston Meadow*, in the county of Wilts. And though few grasses are more productive, or better calculated for hay or pasturage, than the rough meadow grass, yet it requires a moist soil, and a situation somewhat sheltered, being liable to be injured by severe cold or excessive drought. It is much relished by every kind of cattle.

5. The *compressa*, FLAT-STALKED, or CREEPING MEADOW-GRASS: It is perennial; grows on walls, house-tops, and very dry situations, and flowers from June to August. This species, in the opinion of Dr. ANDERSON, is the most valuable of the meadow-grasses. Its leaves are firm and succulent; of a dark Saxon-green colour; and grow so closely together, as to form a pile of the richest pasture-grass. Its flower-stalks continue to vegetate very luxuriantly during the summer; and, even in a fading state, the leaves retain their beautiful green cast. The latter are much larger, and more abundant than those of the roughest meadow-grass. Besides, it produces a fine turf in parks and sheep-walks, while it renders the flesh of deer and sheep, uncommonly tender and sweet flavoured; being a favourite food of these animals. [vol. 3. p. 196.]

6. The *palustris*, or MARSH MEADOW-GRASS, which abounds in marshes and overflowed lands. It grows to the height of four or five feet; is excellently calculated for laying down spongy or fenny grounds; and is reputed to be equal, if not superior, to any other vegetable for the purposes of the dairy. In autumn, however, its leaves become somewhat prickly.

7. The *maritima*, or SEA-MEADOW-GRASS, which is frequent on the sea coast, and flowers in the months of June and July. It is one of the principal grasses which grow in salt marshes, and is eagerly eaten by cattle.

[*Poa viridis*, Green-grass, Spire-grass, or Spear-grass was described under article GRASS.]

MEADOW-SAFFRON, or TUBEROOT, *Colchicum autumnale*, L. an indigenous perennial plant, being the principal of three species; growing in meadows; flowering in the months of August and September.

The flower of this hardy plant rises immediately from the root, and its large leaves appear in the succeeding spring: the former afford a beautiful variety of purple, white, red, rose-coloured, yellow, &c. with single and double flowers. This vegetable is more ornamental than useful; and, though it frequently occupies a considerable part of a meadow, it is never touched by horses.

In its medicinal properties, the Meadow-Saffron resembles those of the Squill: the root of the former has ever been considered as an acrid poison, but it is less injurious in autumn than in the spring; its seed is also deleterious, though not mortal to either man or cattle. The juice expressed from the

leaves of this plant, when rubbed on the skin of animals, affords a very powerful and effectual remedy against vermin, with which they are often infested.

MEADOW-SWEET, the COMMON, or QUEEN-OF-THE-MEADOWS, *Spiræa ulmaria*, L. an indigenous perennial plant, growing in moist meadows and on the banks of rivers; flowering in the months of June and July. Its stalk attains the height of four feet; and the fragrant flowers, when infused in boiling water, impart to it a very agreeable odour, which rises on distillation: hence they are often employed by wine-merchants, for improving the flavour of *made* wines. The roots are so powerfully astringent, that calf-leather has been tanned with them in a fortnight. According to BRYANT, the Russians prepare of these roots a palatable granulated flour or *groats*; and OLAFFEN informs us, that the Icelanders dye a durable black colour, by a decoction of the whole plant. Hogs devour the roots with avidity; goats and sheep also relish this herb, but cows and horses refuse it.

MEALY-TREE. See GUELDER-ROSE.

MEASLES, or *Rubeola*, a contagious disease, accompanied with inflammatory fever, sneezing, defluxion of a thin humour from the eyes, and a dry hoarse cough. On the fourth day, and sometimes later, small clustered pimples break out on the skin, but which generally disappear in three or four days, leaving behind branny or mealy scales.

The measles bear great resemblance to the small-pox, and likewise affect a person once only during his life. They are most frequent among children in the spring, but, if properly managed, seldom prove fatal.

The disease commences with a fit of shivering, succeeded by intense heat, thirst, anxiety, sickness, and vomiting, which vary in different constitutions. The eyelids are swelled; the eyes partially inflamed, and weeping; a constant drowsiness prevails; and, on the fourth day the pustules appear first on the face, and gradually spread over the whole body. The vomiting ceases, but the fever, cough, and difficulty of breathing, are increased. In the course of three or four days the pimples assume a pale colour, and by the ninth or tenth, are not to be perceived. But, the fever, and other symptoms will not abate so early, if the patient be not sufficiently cool: they are sometimes succeeded by an alarming and dangerous looseness, which may terminate in death, unless the strictest attention be paid to the whole state of the disorder.

Cure: As the measles are of an inflammatory nature, it will, in some instances, be necessary first to bleed the patient, especially if the fever be violent; though that operation is, in general, neither necessary nor advisable.

In mild cases, it will be sufficient to keep the patient's body open, by means of tamarinds, manna, or other gentle laxatives; and to supply him frequently with barley-water, linseed-tea sweetened with honey, or other cooling and mucilaginous drinks. Considerable benefit will result from bathing the feet in warm water; and, if there be a disposition to vomit, it ought to be promoted by the liberal use of lukewarm water, or chamomile tea. The dry cough will be great-

ly relieved by gentle opiates, if used with due precaution, in preference to the oily or demulcent draughts given on such occasions.

The most fatal period of the measles, however, is at the *crisis*, or turn: should the fever then become violent, and the patient be in danger of suffocation, relief may be obtained by repeated venesection and blisters. If nevertheless, the disorder appear to affect the interior organs, or *strike inward*, the imminent danger may sometimes be averted, by applying blisters both to the arms and legs, and briskly rubbing the whole body with warm flannels.

The patient's regimen throughout this disorder, ought to be strictly *cooling*. His food should be light, and the drink may consist of barley-water, balm-tea, infusions of linseed, or other diluent liquids, sweetened with a little honey. When the malignity of the disorder is subdued, it will be advisable to administer a few gentle laxatives; and, if it be attended with a debilitating diarrhœa, this may be mitigated by taking a few grains of rhubarb every morning, and gentle opiates every night..... The diet should uniformly be light, though nourishing; and the patient will also derive great benefit from frequent exercise in the country air.

[After the measles, the body is left in a disposition to be affected by cold, more sensibly than after most complaints. After an attack, therefore, of this disease, the greatest care should be taken to keep the body warm, and to expose it to the air by degrees.]

MEASURE, in a legal and commercial sense, denotes a certain proportion or quantity of any commodity, whether dry or liquid, that is bought, sold, valued, &c.

Measures vary according to the different kinds and dimensions of the respective articles. Hence they are, in general, either longitudinal, which relate to lengths; or cubical, that is, solid measures, for bodies and their capacities. Of both we shall give a concise account; as our work would otherwise be incomplete.

I. Long-Measure.

The smallest nominal part of the English long measure, is an *inch*, which is composed of three barley-corns, being the largest and finest that can be selected from the ear. Three inches form a palm; an equal number of palms make a span; $1\frac{1}{3}$ span, a foot; $1\frac{1}{3}$ foot a cubit; 2 cubits a yard; $1\frac{2}{3}$ of a yard make a pace (consisting of *two* steps); $1\frac{1}{2}$ of a pace, a fathom, $2\frac{1}{2}$ fathoms form a pole; 40 poles, a furlong; and 8 furlongs are computed to a mile.

II. *Measure of capacity for dry articles.*

1. For Corn. The standard measure for salt, all kinds of grain, and other dry commodities, is the Winchester gallon, which contains eight pints, or $272\frac{1}{2}$ cubic inches: 2 gallons make a peck; 4 pecks a bushel: and 8 bushels a quarter. Four quarters of corn are computed to a chaldron; five quarters to a *wey* or load; and ten quarters to a ton.

2. For Coal. In measuring sea-coal, five pecks make a bushel; 9 bushels, a quarter; 4 quarters, a chaldron; and 21 chaldrons are computed to a score.

III. *Liquid Measure.*

The English liquid measures were originally established on the basis of Troy-weight: it having

been enacted by several statutes, that eight pounds troy of wheat (the grains of which have been selected from the middle of the ear, and well dried,) should weigh a gallon of *wine measure*; and that the divisions and subdivisions of the latter should form the decreasing smaller proportions. It was farther provided, that one liquid measure was to be uniformly adopted throughout the kingdom. Custom, however, has prevailed, and a new weight, namely, AVOIRDUPOIS, (which see), was introduced; so that a second standard gallon has been adjusted to the old one, which it exceeds in the same proportion as the avoirdupois does the troy weight. From this standard, two different measures are regulated for *ale* and *beer*, which we have already stated under the articles FIRKIN, BARREL, HOGSHEAD, &c. The old standard measure (being kept under seal at the Guildhall, London) is employed for wine, spirits, &c. and contains the following subdivisions:.....$28\frac{7}{8}$ solid inches form one pint (wine measure);.....8 pints make a gallon;.... 18 gallons, a rundlet;...$1\frac{1}{2}$ rundlets, a barrel;....$1\frac{1}{2}$ barrels, a tierce;.... $1\frac{1}{2}$ tierces, a hogshead;....$1\frac{1}{2}$ hogshead, a puncheon;....$1\frac{1}{2}$ puncheons, a butt or pipe;....and 2 pipes, a tun.

These are the chief measures at present employed; a knowledge of which is very useful, and necessary, to prevent imposition. For this purpose, standard measures are kept in various parts of England, in conformity to which all others are directed to be made; so that, if any one be accidentally lost, it may be easily restored; or corrected, if it be inaccurate.

MEAT, a general appellation for the flesh of animals when prepared for food. As we have already, under the article FLESH-MEAT, given the most effectual methods of preserving it in a fresh state during the summer months, and as we specify the simplest and best modes of pickling it under the heads of BEEF and PICKLE, we shall at present briefly state the treatment proper to be followed, in case any *putrid meat* has been accidentally eaten.

As soon as this unpleasant circumstance is apprehended, or discovered, it will be necessary in the first place to take a brisk emetic; the operation of which ought to be promoted by strong chamomile tea; that of itself is an excellent antiseptic. The patient should, next drink liberally of the vegetable acids; and avoid eating or drinking any matter that may tend to press upon the organs of digestion, till the latter be restored to their natural tone and energy.

[MEDEOLA, a genus of plants containing two species, one of which, viz. *Virginica*, is a native of the United States. It is called, *Indian Cucumber*. The root is eaten by the Indians; and the Editors of the *Medical Repository*, vol. i. p. 49, Hexade, 2, stile it the "*Delicate Cucumber Root*."]

MEDICINE, is the art of preventing, curing, or alleviating those diseases, with which mankind are afflicted.

The history of medicine is lost in the remotest antiquity; we shall, therefore, confine our attention to the *effects* of medicines on the human body, and refer the reader to the article PHYSICIAN.

The operation of medicines on the human body has been attributed to various causes; several eminent physicians of the 17th and the 18th

century ascribing their effects to mechanism. This opinion, however, has been strongly opposed, and, though the theory of *chemical decomposition* which now prevails among the medical philosophers of France and Germany, is more plausible, and in many instances strongly corroborated by facts, yet this, like all other conjectures tending to account for the hidden operations of Nature, does not deserve the name of a *theory*.

When judiciously administered, medicines are doubtless, very beneficial; but if they be given or *prescribed* at random (which is but too often the case with those regular and irregular practitioners who degrade an honourable profession to a *trade*,) they seldom fail to be productive of injury:....instead of affording relief, they aggravate the complaint, and not unfrequently lay the foundation of future disease.

Particular constructions require a peculiar treatment: and, if more attention were paid to this important circumstance, there would be less occasion for employing *drugs*. Besides, it ought to be considered, that no substances but such as contain *alimentary* matter, are conducive to the welfare of the human body, in a *healthy* condition: hence, by analogous reasoning, no drugs whatever, if devoid of nutritious properties, can be perfectly harmless, in a *diseased* state.....See QUACKERY, PHYSICIAN.

MEDICK, or *Medicago*, L. a genus of perennial plants, comprising twelve species; the principal of which are the following:

1. The *sativa*, See LUCERN.

2. The *falcata*, YELLOW MEDICK, or BUTTER-JAGS; growing wild in sandy pastures and cornfields; flowering in the month of July.

This bushy plant, if its stalks be properly supported, attains a height of four feet; it may be easily propagated by seed, in hot, dry, barren, and sandy situations, where it produces excellent hay. Its culture deserves to be strongly recommended; as it requires but an indifferent soil; withstands the severity of winters better than lucern; and is eaten eagerly by cattle, especially by horses, though its stalks are hard and woody.

3. The *lupulina*, TREFOIL; MEDICK, or MELILOT TREFOIL; which grows in corn-fields, meadows and pastures; it flowers from the month of May till August..... This species is cultivated in the county of Norfolk, under the name of *Nonsuch*, and is usually sown together with ray-grass; whence, the crops are denominated black and white Nonsuch.....The trefoil medick thrives best in a loamy and swampy soil: goats, cows, horses and sheep eat both species of this plant; though the latter is less grateful to these animals, than the former.

MEDLAR-TREE, the COMMON, or *Mespilus germanica*, L. a native of Britain, growing in hedges, and flowering in the month of May.

This hardy shrub is cultivated in gardens, either for the sake of its fruit, for standards, or as espaliers. It will thrive in any common soil, or situation, and may be propagated either by seeds, which lie two years under ground before they vegetate; or by grafting, or inoculating it on hawthorn or crab-tree stocks.....When designed for fruit-trees, they may be trained as dwarfs, for standards, or for espa-

liers; in either case, they are managed in a manner similar to apple or pear trees.

Grafting, or budding, is the best and most certain method of cultivating the different sorts of the medlar, so as to continue their species: after pruning their first shoots from the graft, or bud, it will be necessary to force out a proper supply of wood for raising a head; then to train the branches chiefly at full length, and to suffer the standards spontaneously to expand.

Medlars possess a subacid, vinous flavour, which to many palates is very agreeable; though disliked by others: while firm and sound, they are of a remarkably austere and repugnant taste, which, however, is completely changed, when they begin in a manner to undergo the putrefactive fermentation, so as to become soft and mellow.....All the species of this fruit ripen about the latter end of October, or beginning of November; when they should be gathered; partly placed in moist bran, in several layers, to facilitate their maturation: partly deposited on straw, in the fruitery. After a fortnight, or three weeks, those kept in the bran will be eatable; and the others will gradually ripen.

In their medical effects, medlars are very astringent, and have therefore been used with advantage in diarrhœas: on the contrary, those who are of a costive habit, ought carefully to abstain from this enticing fruit.

According to Gleditsch and Bautsch, the leaves, branches, and unripe fruit of the medlar-tree, have been successfully employed in tanning.....The wood, being hard and tough, resembling that of the pear-tree, is useful for various domestic vessels, as well as for the smaller implements of husbandry.

MELANCHOLY, or partial insanity without any affection of the stomach, is one of those humiliating diseases which are peculiar to mankind.

Innumerable are the causes which may induce this most dreadful of human maladies; but there is one *material* circumstance, which, independently of the mental state, always occurs, and evidently operates in all melancholic patients; namely, an accumulation of impurities in the alimentary canal, consisting chiefly of *black bile*. Hence originate, want of appetite; a disturbed sleep; obstructions of the intestines; hemorrhoidal and gouty symptoms; irregular circulation of the blood; dulness and gloom of mind, without any apparent cause; at length, stupefaction and insensibility, terminating in madness...Indeed, the melancholic and hypochondriac are so nearly allied, that it is not always easy to discriminate between the two diseases; a distinction which is the more important, as the proper method of curing the former would inevitably be attended with fatal effects to the latter: hence we shall point out the essential difference subsisting between them. In *hypochondriac* persons, the nerves are primarily affected, and contribute to generate all those spasmodic and other concomitant symptoms which disorder the organs of the lower belly: whereas, in the *melancholic*, there already exists in the same organs a material and local cause that produces similar

effects, of which the nervous system of the hypochondriac partakes only so far as he is susceptible of such impressions, in the debilitated state of his mind.

Cure.....If the patient be young, robust, and of a full habit, bloodletting will first be necessary. Next, he ought to take resolvent emetics and purgatives, consisting of neutral salts, especially tartarized kali, in doses of from two to three drams every morning and evening, for several days.....Acidulated drinks, and a vegetable diet, will be of essential service, if combined with exercise and cheerful company. Among the most proper articles of the table are, ripe fruit in a fresh or dried state, honey, bulbous roots, salad, and well baked bread; but animal food should be carefully avoided. For common drink, the patient may use sweet whey, decoctions of barley acidulated with mead-vinegar, or currant-jelly; infusions of tamarinds or rennets, &c. On the contrary, tart wines and spirituous liquors, or mixtures of every description, especially *punch*, always aggravate the complaint. When habitual costiveness prevails, GRANT recommends the following draughts which are grateful and efficacious, without debilitating the stomach or bowels: Take one ounce of manna; half an ounce of tartarized kali; eight blanched sweet-almonds; and six ounces of rose-water; let the whole be duly incorporated in a mortar, and a tea-cup full be taken every hour, till it operates. After the desired effect is produced, a glass of good old wine, and nutritive mucilaginous food, may be safely allowed.

By a strict adherence to this regimen, there is reason to hope for a complete cure, in three months. If, however, the patient be intractable, and averse to adopt any regular plan (as is too frequently the case in this complaint), he should be prevailed upon to travel; to drink purgative mineral waters; to use the cold bath; to have his head shaved, for the purpose of applying a sponge or cloths dipped in cold water; and to receive gentle electric shocks, directed from a wooden point through the region of the lower belly. On the whole, experience has evinced, that *cold* bathing is most conducive to the recovery of hypochondriacs, while the *tepid* bath best agrees with maniacs.

Lastly, it is remarkable, that the *propensity to suicide* is, strictly speaking, a characteristic symptom of black melancholy; the principal seat of which [was formerly supposed] to be in the nervous texture of the spleen, and the left arch of the colon. Many writers consider this dreadful complaint to be peculiar to the English; as it more rarely occurs among other nations of Europe. It is farther worthy of notice, that such gloomy disposition of mind, not unlike the true mania, generally manifests itself at certain changes in the atmosphere; for instance, when southern winds prevail, and the barometer sinks till near the mark which indicates *storm*:....then the fatal crisis either takes place in nine days, or the patient overcomes the attack, which terminates in calm, placid, melancholy, or a stupid insensibility.....On such occasions, profuse draughts of cold and pure spring water; a strong, well-fitted waistcoat; and a blister, applied to the region of the spleen, will be the most appropriate reme-

dies. If the left side, under the short ribs, should be perceptibly warmer to the touch than the opposite side, the blister ought to be nine inches long and six inches broad, in order to cover exactly the *left hypochondriac region*, where the spleen is situated. Unexpected relief has often been thus obtained: and the cure has been promoted by light, though nutritive food, exercise, diversions, music, &c.

[MELANTHIUM, *muscatoxicum* of Walter. Fly Poison. A beautiful flowering plant, growing in the savannas of Carolina and Georgia.....A single naked spadix rises erect from a tuft of graminous leaves, and crowned with a spike of white flowers. The leaves are eight or ten inches in length, and a half or three quarters of an inch broad: of a lively green colour, and spread round about the stem on the ground. This plant possesses deleterious qualities, and is seldom or never eaten by deer, or cattle. A strong decoction of it, sweetened, is used to kill flies. Rats are also destroyed by it..... WILLIAM BARTRAM.

MELIA, a genus of trees, comprehending five species, one of which, though not a native has been naturalized in the United States, and deserves notice. This species is the *M. Azederach*, which on account of its good qualities, merits particular regard.

This tree abounds in the southern states, and also bears the climate of Pennsylvania. It arrives to a great size in the southern states; and grows rapidly, if planted in a rich, loose, dry soil. It bears the names of Pride of China. Poison-berry-tree, (from the effects of the berries on birds) Pride of India, Bead-tree. The pulp surrounding the stone of the fruit, contains a large quantity of oil, of which the inhabitants of Japan, and South-Carolina and Georgia, make candles, and soap. In Persia, according to MICHAUX, the pulp investing the stone, is pounded with tallow, and used in cases of *scald-head*, (*Tinea Capitis*) in children. A decoction of the bark of the root is an excellent remedy for worms, and is in general use in the southern states in that complaint. The dose is from two table spoonfuls, to a gill, three or four mornings, upon an empty stomach.]

MELIC-GRASS, or *Melica*, L. a genus of perennial plants, comprising 14 species, of which the following are the principal:

1. The *nutans*, or MOUNTAIN MELIC-GRASS, which abounds in the mountainous woods of the northern parts of Britain: it flowers in the months of June and July. This species is eaten by cows, horses, and goats;....in the Isle of Raasay, it is manufactured into twine for fishing-nets, which are remarkable for their durability.

2. The *coerulea*, or PURPLE MELIC-GRASS, growing on boggy barren meadows and pastures, and flowering in the months of July and August. This valuable plant is eagerly eaten by horses, sheep, and goats: it also affords an excellent substitute for hair, in the manufacture of brooms, which furnish considerable employment for the country people, in the western counties of England.

3. The *ciliata*, or FRINGED MELIC-GRASS.

4. The *altissima*, or LOFTY MELIC-GRASS....both are exotic, but valuable plants; as the former thrives on barren stony hills, where its stalk grows from two to three feet high, and is an excellent pasture-grass; while the latter is of a bushy nature, delights in almost every soil, and is much relished by cattle. Both species, therefore, deserve to be diligently cultivated in the northern parts of Britain, where large tracts of mountainous land produce scarcely any grass for sheep.

MELILOT, the COMMON, MELILOT-TREFOIL, KING'S-CLOVER, or HART'S-CLOVER, *Trifolium Melilotus officinalis*, L. an indigenous plant, growing on a stiff soil; on ditch banks; in thickets, hedges; corn-fields and meadows; flowering in the months of June and July....This plant is eaten by sheep, goats, cows, hogs, and particularly by horses, which devour it with great avidity. Its fragrance increases when dry; and if its flowers be distilled, they yield a water, which, though possessing little odour in itself, imparts a very grateful flavour to other substances.

BECHSTEIN remarks, that the common melilot is frequently covered with *mildew*, which renders it extremely pernicious to cattle.... Thus, in Thuringia, a distemper prevailed lately among sheep, great numbers of which died of a putrid liver; because this and other species of clover were, through the whole summer, affected with the mildew; nay, even the hares were then uniformly in a state of putrefaction.

MELON, the COMMON, or MUSK-MELON, *Cucumis melo*, L. an exotic plant growing wild in Asia, whence it has been introduced into the south of Europe, and is also cultivated in Britain, on account of its delicious fruit....It is propagated from seed, which should be from three to six years old, and be sown at two different periods, in order to obtain a succession of crops.

[Those who wish to rear melons in perfection, must be careful in the first place, to procure good seed; secondly to plant them remote from an inferior sort, from cucumbers, squashes, and gourds; as degeneracy will infallibly be the consequence of inattention to these directions. The kind called *Cantaleufie*, has generally been most esteemed in the United States, but the true *Cantaleufie*, having many knobs and protuberances is never seen in the markets of Philadelphia. Of late, the *nutmeg* melon has been much propagated, for its superior flavour.

The author of *Gleanings from Books of Husbandry*, *London*, 1803, directs, "when the melons have gotten four leaves: to pinch off the tops with the finger and the thumb; and again, when they have two or more lateral shoots, and two or more joints: secondly, to have fine fruit, to permit but one to remain on a stalk, and to pinch off the end of the runner at the third joint above the fruit; and also new runners, that appear below the fruit should be checked."

"Covering the plants with *mats* when the leaves droop, refreshes the plants more than watering..... When the fruit appears, the plants should be but slightly watered, but the earth about the beds well moistened. The leaves must not be taken off.

To prevent the ravages of the melon fly, see CUCUMBER.]

The second crop should be sown about the middle of March, and treated in a similar manner. When they have taken root, their management will vary but little from that of cucumbers, excepting that melons require more air, and a small quantity of water. As soon as the plant spreads into branches, it must be properly clipped, so that only two of the principal shoots may remain; and, in order to produce perfect and ripe fruit, one only should be left [with the longest stalk] and all superfluous young melons immediately removed as soon as they appear. Besides, the diseased leaves and branches, together with the forked extremities, ought to be continually cut off; and, when the fruit is *set* or formed, it will be necessary to place thin boards, stones, [or tiles] under each, and to turn it gently twice in the week, that the whole may be equally benefitted by the sun and air. When fully grown, it must be plucked at a proper time, as it will otherwise lose a considerable part of its flavour. Thus, if melons be intended for the table, they should be cut early in the morning, immersed in ice, or cold spring water, and kept in the coolest place, till they are used. The most certain criterion to ascertain the maturity of this fruit, is its cracking near the footstalk, and beginning to smell; in which state it may be gathered without delay.

MELON, the WATER, or *Cucumis Anguria*, L. though properly a species of the former, is by some considered as a distinct genus of exotic plants, comprising three species, of which one only is known in Britain, by the name of *Citrul*. It is cultivated in all the warm countries of Europe, and also in Asia, Africa, and America; where its salubrious and cooling fruit is greatly esteemed.

The water-melon is propagated from seed, in a manner similar to the former....In its properties, the species nearly resembles the preceding; but, partaking more of the nature of cucumbers, water-melons require a larger proportion of spice and wine; as otherwise they are apt to induce flatulency or diarrhœa.

[The cultivation of the water-melon is so well understood in the United States, that no directions on the subject are requisite in this place. They afford a very refreshing article of diet in our warm summers; and yield considerable profit. The juice of the sweeter kind yield, on inspissation, a bright light-coloured syrup, which would answer every purpose required of any syrup. Mr. HENRY DRINKER of Philadelphia, procured half a pint of this syrup, from 14 lbs. of melon-juice, a part of which I tasted, and found very pleasant.... Mr. BORDLEY, who is practically acquainted with the cultivation of the fruit, makes the following calculation upon Mr. DRINKER's experiment.

"Melons growing at $5\frac{1}{2}$ by $5\frac{1}{2}$ feet apart, are 1433 plants on an acre: these bearing two melons of 14 lb. each, yield 4000 lb. of melons, 1433 pints of syrup; which, at 10 cents, would come to 143 dollars, for an acre's produce."

Taking the amount at one half the above sum, it would be more than is produced from many acres of land, in other cultivation, in sandy impoverished soils. Having millions of acres covered with the

sugar maple, and thousands of acres fit only for the cultivation of the water-melon, the United States need be under no apprehension of the want of sugar.....Dr. PALLAS, in the account of his journey to the southern provinces of Russia, in 1793 and '94, speaking of a colony of Moravians at Sarepta, or Sarpa, on the river Volga, says: "The ingenious inhabitants of this town, brew a kind of beer from their very abundant and cheap water-melons, with the addition of hops: they also prepare a conserve or marmalade from this fruit, which is a good substitute for syrup or treacle.]

MEMORANDUM, a term implying a note, or mark, made either on paper or otherwise, with a view to assist the memory.

In the present artificial state of society, the convenience of a *memorandum-book* is obvious to every person engaged in active pursuits. And though the utility of such a measure be universally acknowledged, yet there is reason to believe that it is not so extensively practiced as it justly deserves..... Those, who reflect on the fleeting nature of human thought, and on the importance of remembering the *train of ideas* which lead to a certain conclusion, will readily admit, that annotations might be rendered equally interesting and useful, if they were extended to that department of human affairs, which more immediately relates to the operations of the human mind.... Thus, if every striking idea, whether of an economical or intellectual tendency, were duly registered and digested, when a more favourable opportunity offers, incalculable benefit would thence result to society. Hence we presume to suggest to those who are accustomed to reflect and attend to the progress of their reasoning (when in solitude, as well as in the common intercourse of life), to note and record in a particular journal, all such sentiments and opinions, as appear to be worthy of being *preserved*....See also JOURNAL.

[MEMORANDUM, COMMON PLACE, OR POCKET-BOOK... The necessity of keeping a faithful narrative of circumstances appertaining to business, is fully apparent to every man. The interest we have in the occurrence of past life, as a guide to our future pursuits, is undoubtedly of considerable importance to the man of leisure and observation; and the arrangement of these events to a philosophical observer of nature, from the multiplicity of interesting objects which are perpetually before him, is undoubtedly of great importance.

The following method has been used by S. W. JOHNSON, Esq. of New-Brunswick, for some years, who finds it still to answer his end very well....

The first column is generally left open until either the postings are done in the ledger, or the alphabetical arrangement of the vol. has taken place.

The second contains the beginning head of common occurrences.

The third is devoted to the Dr. of acct. lying open, when monies are paid, or goods transmitted.

The fourth devoted to the commencement of improvements, or experiments in agriculture, gardening, or chemistry.

When this vol. is filled, an alphabet may easily be made by the initials in the first column, and the figures therein will shew, that the different accounts in the ledger, are posted with the journalized entries.

1st.	2d.	3d.	4th.	
				January 1, 1803.
	Stiles			(John) agreed to serve me for the ensuin year at 120 dolls. per ann.
	Henry			at farming, on the new road over swamp, all day.
	Self			Balanced accts. with A. B.
	Bean			paid in full....See his account.
5		Charges		to cash for Christmas boxes 2 25
3		Farming		to cash, paid for new handkfs. 7 75
	Choice			(Mr.) called and had his power of attorney corrected and forwarded.
	Mease			(Doctor) wrote to.....See copy
			Peas	had my first crop put in this morning on S. side of Bowley.

And during the time such a pocket volume is filling, if any common occurrence is sought, such as the number of days any labourer has worked, or any specific agreement made, or any particular event taken place: by running the finger down the second column, it will soon be manifest. If on accounts of payment being made, the third will shew it, and if any experiments have been made, in any of the three branches alluded to, the fourth will shew every particular concerning them.....The first column should not be filled up except to alphabet by, or when the postings are made.]

MEMORY, a mental faculty, which consists in the power of reviving former impressions of our ideas, or the particular circumstances which occasioned and accompanied them.

Memory may be divided into two species; *passsive* and *active:* the former is the remembering, or recalling of things or events to the mind with little or no effort; the latter is the *recollection* of remote circumstances, or objects, which do not immediately or spontaneously occur. This is a talent of infinite importance to its possessor; and many rules have been given for its direction, improvement, and preservation; but the principal, and indeed the only effectual method consists in the strictest *temperance* in eating, drinking, and sleep..... Excess of every kind clouds the brain, and stupefies the mind: hence we rarely find an intemperate person, whose memory is clear, quick, and tenacious.

Such, however, is the precarious basis of our mental powers, that notwithstanding every effort, it frequently happens that those ideas, which appear to us the most interesting and desirable to be retained, insensibly and irrecoverably vanish from the mind. To assist this inherent weakness, various methods have been proposed; for instance, noting down in a memorandum-book, or journal, the substance of an essay we have perused; or extracting the most important passages from the best authors; or even registering such of

our own ideas, as often intuitively or spontaneously occur, in consequence of sudden and unexpected events.

Expedients of this nature constitute the *art of memory*, and those of our readers, who are inclined to avail themselves of such assistance, and to try its effects, may resort to a treatise extant on the subject, and intitled *A New Method of Artificial Memory*. Let it, however, be remembered, that it is not *extraneous* aid, but constant attention and exercise, which form the true art of memory.

MENSTRUUM, in general, signifies all liquors employed as solvents of other bodies, with the minute particles of which the former combine, so as to produce a new, uniform compound: they are chiefly used for extracting the virtues or ingredients of matters more solid than themselves, by infusion, decoction, distillation, &c.

Water is the solvent of all salts, vegetable gums, and animal jellies. Rectified *spirit of wine* is the menstruum of the essential oils and resins of vegetables, of soap, &c. *Oils* dissolve vegetable resins and balsams, wax, animal fat, mineral bitumens, sulphur, and certain metalic substances, particularly lead: yet, for this purpose, the expressed oils are more powerful *menstrua* than the distilled; because the former are not so liable as the latter to be volatilized in a strong heat, which in most cases is required for enabling them to produce the desired effect.

All *acids* act as solvents of alkaline salts and earths, as well as metallic bodies; but their action greatly varies on different metals: thus, the *vegetable* acids dissolve a large proportion of zinc, iron, copper, tin, and antimony, but particularly lead, if previously corroded by their steam. The *marine* acid, or spirit of salt, dissolves zinc, iron, and copper; and, if combined with the *nitric* acid, or aqua fortis, a proper menstruum is obtained for gold and antimony. The *vitriolic* acid, or oil of vitriol, acts upon zinc, iron, and copper: it also corrodes or imperfectly dissolves most other metals.

Alkaline lixivia, or leys, dissolve oils, resinous substances, and sulphur: by adding *quick-lime*, they become more powerful, as is evident in the preparation of common soap. By such addition, the flesh, skin, and bones of animals may be reduced to a jelly.

Solutions effected in water, and spirit of wine, possess the virtues of the substances dissolved; but oils generally sheathe their strength, while acids and alkalies change their qualities. Thus, water and distilled spirits are the proper *menstrua* of vegetable and animal matters, the efficacy of which is to be preserved.

Most of the solutions mentioned are easily made, by pouring the menstruum on the substance to be dissolved, and exposing both, for some time, to a proper degree of warmth. Oils and alkaline liquors generally require a strong heat to increase their solvent power; and acids, likewise, do not act on some metals without this aid. Watery and spirituous menstrua may be rendered more expeditious by a moderate heat; and the quantity they hold in solution, will be greater than without this assistance: but, on becoming cold, that proportion of soluble matter which

was in a manner, kept suspended by heat, again subsides. As the action of acids on metallic bodies is generally attended with heat, effervescence, and a copious discharge of fumes, which are highly inflammable, such as those arising from the solution of iron in the vitriolic acid, the operator ought never to approach the vessel with a candle, or other burning substance; as the exhaling vapour would thus instantly be set on fire and cause an explosion.

Lastly, there is another species of solution in which the moisture of the atmosphere is the menstruum. If fixed alkaline salts or earths, for instance, potash, as well as the neutral salts composed of the former, and the vegetable or any other acids (except the vitriolic, and some metalic salts,) be exposed for some time to a moist air, they gradually absorb humidity, and at length become liquid; a process which is termed *deliquation*.

MERCURY, or QUICKSILVER (*Hydrargyrus*), a mineral fluid, about fourteen or fifteen times heavier than water: it is so remarkably *thin*, that it requires the intense cold of 40 degrees below 0, of FAHRENHEIT'S scale, to render it solid. When exposed to fire, it may be totally volatilized.

Quicksilver is found sometimes in a native state, as in the mines of India, South America, Hungary, &c. but more generally mixed with metals, stone or other substances, from which it is extracted by various processes. Next to gold, and platina, mercury is the heaviest of all metals, with most of which it unites, excepting iron and antimony: hence it is employed in considerable quantities, for extracting gold and silver from the earthy matters with which they are mixed. The amalgam, or incorporation of quicksilver with gold, serves to gild copper or silver, so that these metals assume the appearance of gold: when united with tin, it is employed in the manufacture of looking-glasses or mirrors, in the manner already described.

Independently of its utility in various manufactures, mercury is extensively employed in medicine; and, though it is the most violent of poisons, when taken inadvertently in too large quantities, yet, if judiciously administered, it has frequently effected a cure, after all other medicines had failed to procure relief. When taken into the stomach undivided, or in its native state, this fluid metal almost instantly passes through the intestines unchanged, and produces no perceptible effect, except that of promoting evacuations, if any crudities or obstructions should prevail in the alimentary canal. Hence it might be advantageously prescribed in the *first* stage of the ILIAC PASSION, before the bowels are too much weakened and corroded by the stagnant feces; especially if it be given together with castor-oil or fat broth, but no spice. The patient, after taking this medicine, should, if possible, walk about the room; and there are instances in which several ounces, nay, half a pound, and upwards, of pure quicksilver, have been swallowed with the happiest effects. But, in the latter stages of obstinate and violent cholics, when inflammation and gangrene have already taken place in the bowels, its

specifie gravity would infallibly rend the intestines, and accelerate the fatal crisis.

[The general use of that excellent medicine *Calomel* renders its perfect preparation a matter of great importance. The following method to determine its purity is given by an able chemist, Mr. Frederick Accum.

"Calomel ought to be perfectly saturated with Mercury.

"Complete saturation can only be known by boiling for a few minutes, one part of Calomel and $\frac{1}{12}$ part muriate of ammoniac in ten parts of distilled water. The fluid must then be filtrated and examined by means of carbonate of potash. If the calomel is well prepared, no change will take place on the addition of this re-agent; but if the preparation is imperfect, a precipitate will ensue, 47 parts of which indicate 48 of muriatic acid, 114 parts of calomel perfectly saturated with Mercury, contain 97 of Metal and 17 of Acid. It should be perfectly inodorous and tasteless, and when rubbed in a stone mortar with ammoniac, become intensely black."

Mercury within a few years has been extensively used as a medicine. It should never be trifled with; and during its exhibition, confinement to an equable temperature in a room, is indispensable. The best way to give it, is in small doses *regularly*, so that the effects may be gradually exerted on the system, and the impression once made, should be carefully kept up as long as is necessary, to prevent much loss of time. The last disease in which mercury has been used with success, is consumption: and several cases of its happy exhibition are related by Dr. Rush in the *Medical Repository*, vol. 5.]

Mercury, the Common English. See Perennial Goosefoot.

Mercury (Dog's). See Dog's mercury.

MESENTERY, in animal economy, signifies that fat membrane, or membranous duplicature, which is situated in the middle of the abdomen, for preventing the intestines from entangling with each other, as they lie in a small compass. It is nearly of a circular figure, being about four inches in diameter, but from three to four yards in circumference, on account of its plaits or foldings. The bowels are tied like a border around the mesentery; as the former are from ten to twelve yards in length, according to the size of the individuals; so that to every inch of this circumference, there are fastened three inches of the latter.

This membrane is by Nature designed to support the intestines in their due place; to strengthen them; and to afford a situation to the milk-vessels (see Lacteals), glands, nerves, blood-vessels, &c. which are connected with the bowels. From its important use in the animal system, it may be easily conceived that the mesentery is liable to be affected with various diseases, the origin and seat of which are often neither suspected, nor clearly understood. It is, however certain, that a disordered state of the *mesentric glands* generally lays the foundation of the rickets, scrophula, wens, white swellings, and early consumption. Hence the injury done to infants, by *stuffing* them with superfluous or improper food; by allowing children pro-

miscuously to eat cakes, gingerbread, and unripe fruit; all of which corrupt the LYMPH (which see), and cannot fail to produce distressing maladies. One of the most fatal, however, is an *inflammation of the mesentery and its glands*; which, though difficult to ascertain, is not a rare occurrence: it is generally accompanied with costiveness, and always with a retention of urine; but seldom with violent fever or pain; and on examining the parts affected, there will appear a large swollen belly, and a deep seated *tension* in the abdomen. Sometimes blood and fetid matter are discharged by stool; and it is remarkable, that male children are more frequently subject to it than those of the female sex; and that the disorder, unlike other inflammations, may prey on the little patient for weeks, before it be discovered; though in acute cases, it proves suddenly fatal.

Cure.....As soon as the nature of this dangerous affection is ascertained, leeches ought to be applied to the lower belly, and a large blister to the small of the back. Emollient clysters, fomentations made of an infusion of chamomile flowers with the addition of laudanum; and the tepid bath, will also be of essential service.

The patient's *regimen* and *diet* should be similar to that stated under article INFLAMMATORY FEVER: he may likewise drink sweet whey with honey, or equal parts of Seltzer water and milk. With a view to check a debilitating looseness, he ought to take decoctions of the salep-root, sago, tapioca, &c.

METAL, signifies a ponderous opaque body, which, in general, is fusible by fire; but when cold, coagulates and concretes into a solid mass, that is capable of being distended under the hammer..... Metals are distinguished by their peculiar brightness, perfect opacity, and great weight: the lightest of them being *seven*, and the heaviest upwards of *nineteen* times more ponderous than an equal bulk of water.

Naturalists have discovered *twenty-one* metallic substances, which essentially differ from each other: they are generally divided into *perfect* or entire, and into *imperfect* or semi-metals. A more accurate classification, however, is that of *ductile* or malleable, the parts of which may be displaced by compression, without being divested of their cohesion; and of *fragile*, or brittle, namely, such as do not admit of being stretched or extended. To the former class belong, gold, silver, platina, lead, copper, mercury, iron and tin: of the latter are, zinc, bismuth, arsenic, cobalt, antimony, nickel, molybdæna, telurium, manganese, wolfram, chrome, titanium, and uranium.....Consistently with the plan of our work, we shall describe only the native, and the more important foreign metals, of which the reader will find a concise account in their alphabetical series, interspersed with such facts, as may tend more fully to display their useful properties.

METALLIC, POINTED SUBSTANCES are often inadvertently swallowed by children and adults; .. in such cases it will be necessary to take large draughts of vinegar, lemon-juice, or other vegetable acids, in order to blunt the points of iron, brass, copper, and other fragments or pins: but never to

venture on an emetic. If the metallic bodies introduced by the mouth, have been of a round form, or if they happen to be detained within the GULLET, we refer the reader to that article.

MEZEREON, SPURGE-OLIVE, SPURGE-FLAX, or DWARF-BAY, *Daphne Mezereum*, L. an indigenous low shrub, growing in woods and shady places, and flowering in the month of February or March. When cultivated in gardens, it attains, in a rich soil, the height of sixteen feet.

The whole of this plant is so corrosive, that six of its berries are said to be sufficient to kill a wolf. ....An ointment prepared from its bark or berries, has been advantageously applied to foul or ill-conditioned ulcers. When chewed, its root occasions ulcerations, and considerable irritation in the throat; but is very serviceable in removing difficulty of swallowing; and Dr. WITHERING (*Botanical Arrangement*, vol. ii. p. 377), states, that a woman who had been unable to swallow any solids, and liquids very imperfectly, for three years before, was effectually cured in two months, and enabled to take any food without difficulty, by chewing a thin slice of the root of mezereon, as often as she could support its irritating effects.....On sudden emergencies, the root of the Spurge-olive, scraped and applied to the surface of the skin, affords, an efficacious substitute for the Spanish-fly, as a blister which speedily operates :....It may also be applied in the form of issues.

DAMBOURNEY obtained from the stalks and leaves of the mezereon, a fine *vigogne* dye; and the stalks, alone, imparted a beautiful gold-brown shade to wool, previously dipped in a diluted solution of bismuth. From the ripe berries of this plant, an excellent red lake is prepared by painters.

MICA, MUSCOVY-GLASS, GLIMMER, or GLIST, a genus of magnesian earths, of which there are two species : viz.

1. The *colorata martialis*, coloured martial glimmer, of which there are many varieties, distinguished by their brown, black, semi-transparent blue, and green shades: they are found chiefly in Lapland, Sweden, and other northern parts of Europe.

2. The *alba*, pure or colourless mica, which contains several varieties, that are found in Siberia and Sweden, and are perfectly transparent; whence it has obtained the name of Muscovy-glass.

Both species consist of thin glittering pieces, that are divisible into leaves, or plates; which when exposed to a moderate heat, become brittle; but, if placed in a strong furnace, they curl or crumple, and are with difficulty reducible into glass. Mica, however, melts easily with borax, by the aid of which it may be converted into glass, with a blow-pipe.

The broad and colourless mica is used in Russia, as a substitute for glass, to which it is preferable; because it resists the shock on the explosion of a cannon.

[This broad colourless mica, is found in large quantities in New-Hampshire, and has been used in this city for lantherns, for which it answers very well. For magazine or ship lanterns it is peculiarly valuable, as no danger will attend the falling of a candle against the side.]

MICROSCOPE, an optical in-

strument, consisting of lenses or mirrors, by means of which, small objects appear of a larger size, than they naturally are to the naked eye.

This valuable instrument, though not entirely unknown to the ancients, was re-invented and made public in the early part of the 17th century: it has, since that period, received continual improvements from various ingenious philosophers and artists, among whom the names of LEEUWENHOEK, WILSON, HOOK, the ADAMS's, LIEBERKUHN, BARKER, GREY, MARTIN, DI TORRE, and SMITH, deserve to be gratefully recorded.

Microscopes are of two sorts, *single* and *double*. The former consist in general of one lens or mirror; but, if a greater number be employed, they only serve to throw additional light upon the object, without farther enlarging its image. Double or compound microscopes are those in which the image of an object is composed of several lenses or mirrors.

The utility of microscopes is very extensive, both to the naturalist and the artist: hence the invention of them must be regarded as one of the greatest efforts of human ingenuity. It is true, they do not contribute in any essential manner to the happiness of mankind; but they serve to unfold the wonders of Nature, and thus insensibly raise the mind to the contemplation of that Great Being, whose works, however minute and apparently insignificant, uniformly evince the highest skill and most perfect symmetry.

MIDWIFERY, or the obstetrical art, a branch of medicine which requires no farther definition. In most countries of Europe, and in other parts of the globe, it is practised by women; for it comprehends their management both before and after delivery, as well as the treatment of the child during the earliest period of life.

Although we have, in a preceding part of this *Encyclopædia*, referred the reader to the present article, with respect to *after-birth*, yet we cannot, conformably to our plan, enter minutely on the subject. It deserves, however, to be remarked, that every degree of anxiety, or impatient conduct, in midwives and nurses, is highly reprehensible on such occasions; for Nature rarely fails to perform her kind offices to the mother as well as to the infant. Hence it will be found from experience, that those *accoucheurs* are uniformly the most successful in the exercise of their profession, who possess a due share of knowledge of the human constitution, together with a philosophical coolness to resist the solicitous applications made by timorous, and often mischievous relations. On the whole, we cannot omit this opportunity of expressing our conviction of the benefits which society has already derived from *professional* accoucheurs; and, if the lower classes are still inclined to employ their favourite *midwives*, we trust the day is not far distant, when such persons will be subjected to a rigorous examination of their talents, and qualifications to undertake an office, equally important and fraught with responsibility. We have ventured to express these sentiments, neither with a view to decry the propriety of employing women (who, if possessed of equal skill and information, certainly deserve the preference) in this primary department of the

healing art; nor is it our intention indiscriminately to introduce into families an inexperienced young *accoucheur*, instead of a grave and expert old matron. The former would be an encroachment of female privilege; while the latter might prove a rash and dangerous measure.

MILDEW, or *Erysiphile*, a disease of plants, consisting of a thick, clammy, sweetish juice, that is supposed to exhale from, or descend on, the leaves and blossoms of vegetables.

The mildew occurs most frequently on wheat, hops, the dead nettle, maple, and the gromwell. It sometimes rests on vegetables in the form of a fatty juice; which, being naturally tough and viscous, acquires these properties in a still greater degree, in consequence of its finer and more fluid parts being exhaled by the sun; so that the plants affected by it, cannot perform the important office of perspiration, and thus never attain to maturity.

According to Dr. DARWIN, the mildew is a plant of the fungus kind, which vegetates without light or change, or air, in the same manner as the generality of mushrooms; and penetrates with its roots the vessels to which it adheres. He suspects, however, the plants affected, to have been previously injured by internal disease; and directs them to be thinned; or to remove those which are contiguous to the disease, in order to admit more light, and greater ventilation: thus the mildew may be remedied, and the plant at the same time restored to its former vigour.

Common wheat is more subject to this destructive disease than that which is bearded, *especially if the land be newly dunged*. As, however, it is highly probable, that the greater dampness of some soils, together with their being over-shadowed by too thick foliage, affords one *permanent* cause of mildew, Dr. DARWIN recommends the land to be properly drained; the ashes of coals, bones, or other drier manures, to be employed; and likewise to *thin* the crops. And, as this *mucor* particularly affects late crops, he is further of opinion that the seed should be sown early in the season; by which means the mildew will not only be prevented but a forward crop will be obtained.

Where this disease has already infested the plants, a brisk shower of rain, succeeded by a smart wind, is believed to be the most efficacious remedy, to prevent its farther progress. If the mildew be observed before the sun rises to its meredian power, it will be advisable to send two men into the field, furnished with a long cord, of which each should hold one end: by dexterously drawing this rope over the ears of corn, the dew will be removed, before the heat of the sun dries and reduces it to that viscous state, in which it obstructs the perspiration of plants. Lastly, it has been confidently asserted, that lands, which have been affected with the mildew for several successive years, have been effectually cured by sowing *soot*, either together with, or immediately after corn; and that hop-plantations may be secured from its injurious effects, by manuring them with hogs'-dung.

M. SEGER, in his valuable German *Treatise on the Mildew*, con-

sidered as the principal cause of Epidemic Diseases among Cattle, &c. (published at Vienna in 1775) observes, that the mildew is so sharp and corrosive, as to raise blisters on the feet of shepherds who go with naked feet; and that it even consumes the hoofs of cattle. He supposes it to be a kind of rust, and to possess some arsenical properties. Its pernicious influence is rendered still more powerful by a variety of circumstances; such, as sending cattle into the fields too early in the spring; suffering them to drink water mixed with ice; or keeping them in close, filthy stables, that are not sufficiently aired.

M. SEGER likewise conceives the *mildew* to be a principal cause of epidemic diseases in cattle..... The particular species, producing such distempers, is that which burns the grass and leaves. It falls usually in the morning, especially after a thunder-storm; and its poisonous properties (which do not continue above twenty-four hours) never operate unless the mildew be swallowed immediately after it has fallen.....The disease first affects the stomach, and is accompanied with pimples on the tongue, loss of appetite, a cough, and great difficulty of respiration. As a preservative, the ingenious author directs cattle to be well purged, both in the spring and in winter; for which purpose he prescribes half a dram of sulphur of antimony, and a whole dram of resin of jalap, for one dose :.....he concludes with cautioning the proprietors of cattle, carefully to avoid the use of emetics, and every thing that is of a heating nature; because such treatment would be productive of fatal consequences.

MILFOIL. See Common YARROW.

MILIARY FEVER, or *Miliaria*, a disease which affects both sexes, at every age, but particularly recluse and sedentary women. It is accompanied with continued fever, anxiety, a sensation of punctures in the skin, and profuse unctuous sweats.

Causes....Excessive watching; the indulgence of the more violent passions; suppressions of the natural discharges, as also too great evacuations; eating of unripe fruit, and similar pernicious trash; a weak watery diet, and impure or putrid water. It is, in general, a primary disease, though it is sometimes consequent on quartan and puerperal fevers.

Peculiarities.....The miliary fever, though not contagious, is an epidemic disease, and sometimes a *critical* symptom in the autumnal putrid fever. It generally commences its attack with a cold shivering, which is succeeded by intense heat, pain in the head and loins, oppression on the breast, and difficulty of breathing. An itching and prickling sensation is felt in the skin, which, between the seventh aud fourteenth days, is covered with numerous small, red, and distinct pimples, that appear first on the neck and chest, and gradually spread over the whole body, excepting the face. This eruption is usually preceded by profuse sweating; and, in the course of two or three days, the tops of the pimples are filled with small white vesicles, which speedily disappear. In the course of a few days, the pustules assume a

yellowish cast, and at length totally vanish, leaving the skin covered with branny or mealy scales.

Cure.....In this, as in all other eruptive fevers, the chief point is, to prevent the pustules from *striking inwards*; as the patient is then in the most imminent danger. In the first period of the disease, blood-letting will, in general, be necessary; and, if the eruption appear and disappear, repeated small blisters may be advantageously applied. It will likewise be advisable to administer, frequently, gentle laxatives; but, if the patient be in a languid state, and the bowels become regular, the liberal use of Peruvian bark will essentially contribute to his recovery. During the whole progress of this fever, he ought to be kept uniformly cool; his diet also should be cooling and nutritious, and adapted to his strength and constitution. Lastly, as soon as he is able to encounter the air, gentle and daily exercise will be attended with the best effects.

MILK, a well-known, nutritious fluid, with which Nature has wisely furnished the breasts of females, and the udders of animals, for the support of their young.

Milk consists of three parts, namely, *caseous*, *butyrous*, and *serous*. The first comprehends the grosser earthy particles, which serve to suspend the butyrous part; and which, when coagulated by art, are formed into CHEESE. The second ingredient comprises the *butyraceous* or oily particles, or cream, which float on the surface of milk, and are by agitation converted into BUTTER. The *serous* are the more watery parts, constituting what is called WHEY, and serving as a vehicle for the two before stated.... The most wholesome milk is that which contains a due proportion of the three constituent parts.

Having already discussed the qualities, as well as the methods of preparing BUTTER, BUTTER-MILK, and CHEESE, under those respective heads, we shall briefly consider the properties of milk, afforded by different animals, as an article of food.

The milk of women, mares, and asses, nearly agree in their qualities, being very dilute, sweet, though acescent, and, when coagulated, easily *broken down*. That of cows, goats, and sheep, possess properties widely different, of these, cows'-milk approaches nearest to that yielded by the female breast. But the milk obtained from goats, is of a peculiar nature; as its oily and coagulable parts do not separate spontaneously, throw up no cream, and yield no butter. That of sheep is rich and nourishing; produces abundance of butter, but which is so unpalatable as to render it unfit to be eaten. Both these fluids afford a large proportion of strong and tough cheese.

Cows' milk forms a very essential part of human sustenance, being adapted to every state and age of the body, but particularly to infants, after being weaned. It should, therefore, be drawn from sound, young, and healthy animals; as it is most nutritious, when these are between three and four years old....Good milk is perfectly white, and totally divested of smell. As, however, it contains a great portion of the fatty or oily particles, known under the name of cream, it ought always to be diluted with water, before it is given to children. But, to scorbutic persons, or those troubled with inveterate ulcers, it

will be found of great benefit, in a pure, undiluted state; as it combines both saccharine and oleaginous particles.

From its balsamic nature, milk promotes the different evacuations, especially insensible perspiration: in a *serous* or diluted state, it has often afforded considerable relief in obstinate coughs; in disorders induced by worms, hysterics, the putrid sore-throat, the gout, and stone, and various other diseases, with which mankind are afflicted. But, if a person be debilitated, or otherwise exhausted by sickness, milk ought by no means to be used; as it is apt to generate cramps or violent spasms in the stomach, the heart-burn, &c. Corpulent and plethoric persons; those who are recovering from febrile complaints; and particularly such as are accustomed to drink wine, and spirituous liquors, cannot with advantage or safety adopt a *milk-diet*; because the fatty and viscid properties of that fluid tend to oppress the stomach, and occasion indigestion.....When milk is used *medicinally*, it ought to be taken as speedily as possible after it has been drawn from the cow; for its most nourishing and attenuating particles exhale, if it be boiled, or even for a short time exposed to the air.

Lastly, if milk be suffered to become *sour*, it cannot be easily digested: and, though it is in that state unfit to serve as an article of beverage, its utility does not cease. There is a liquor, distilled from acid milk, butter-milk, or whey, which is asserted to be a valuable menstruum in the preparation of colours.

Milk being of such extensive utility, both as food and medicine, our readers will probably expect some account of such vegetables as are calculated to encrease the quantity of that sweet and wholesome fluid. One of the most effectual methods, consists in giving cows, every morning, decoctions of the richest and most fragrant species of clover, and especially of *lucern*.....This subject has already been concisely discussed under the article CATTLE, and, as we state the *lactiferous* plants in their alphabetical order, it would be superfluous to repeat them in this place:.....they will also be registered in the General Index of Reference.....But we cannot omit to animadvert on the culpable filthiness in which cows are confined, both in the metropolis, and in its vicinity, where these useful animals are literally *crammed*, not with wholesome food, but with such matters as are calculated to produce an abundance of milk. This unnatural practice, however, would in some degree be *venial*, if that milk were vended in a *pure* state. It is, indeed, a notorious fact, which we think our duty to state, that vessels both of hot and cold water, are always kept in the cow or milk-houses, for the accommodation of mercenary retailers. These persons purchase a certain quantity of *unadulterated* milk, and at a low price; but, as each must make his or her profit, they mix with it such a proportion of water as they may think necessary to make their milk of a *sufficient standard*; when it is hawked about at the present exorbitant price. Circumstances of this fraudulent complexion ought to be more generally known; and we trust that the vigilance of the police will soon be extended to the

suppression of practices and abuses, equally bold and iniquitous.

Skimmed milk, is that which remains after the cream has been taken off its surface. It is often sold for new milk, and employed in considerable quantities by wine-merchants, for the purpose of clarifying, or fining down turbid *white* wines, arrack and weak spirits; but it should not be used for *red* wines, as it discharges their colour....This kind of milk is also useful for *whitening* such wines, as have acquired a brown tint, either from the cask, or in consequence of having been boiled, before they have undergone the vinous fermentation. In such cases, a little skimmed milk precipitates the colour, leaving the wine almost limpid, and of a pleasant flavour.... A fluid of such harmless nature is in every respect preferable to the noxious matters, with which avaricious vintners, poison their turbid or damaged wines.

THE MILK OF THE FEMALE BREASTS is frequently very troublesome to delicate women, and subjects them to many disorders. The more common of these are:

1. Deficiency of this nourishing fluid, which is often occasioned by the indulgence of anger, or other passion; worms; or intestinal complaints. Those who are advanced in years, before they become mothers, are particularly liable to this complaint, which is likewise induced by poor aliment, or some constitutional defect in the fluids. If the latter cause be obvious, it will be advisable to administer absorbent powders; but, if it originate from parsimonious living, the patient's diet ought to consist of rich cow's milk, and light nourishing food. Should, however, such deficiency be *absolute* and the breasts be totally devoid of this salutary fluid, the only method of preserving the infant's life will be, to procure a careful, healthy, wet-nurse.

2. Excess, or evident abundance of milk, occurs as frequently as the contrary; and requires the greatest attention: for, otherwise, inflammation and abscesses in the breast may be the consequence. Hence the patient should live sparingly, and suckle two infants, with a view to diminish the too rapid flow of milk.

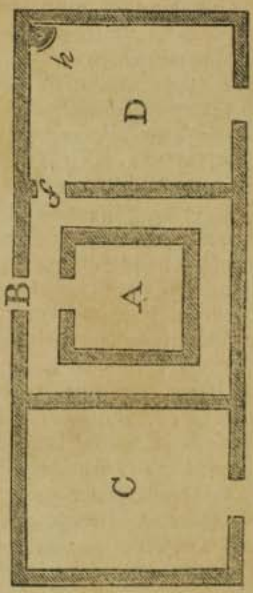
3. The *Milk-fever*, one of the most alarming diseases of females, is sometimes occasioned by terror, taking cold, &c. though it is more frequently induced from a false principle of delicacy, by neglecting to put the infant to the breast. It occurs, in general, a few days after delivery, and requires to be treated with the utmost precaution. To check its progress, it will be necessary to resort to camphorated clysters, gentle evacuations, and embrocations of linseed and similar emollient oils. The infant ought, likewise, to be put frequently to the breast; and, if no relief be thus obtained, they should be drawn, either by means of the small air-pump, or some expert person. The patient's diet ought to be light and cooling; but, if the fever prove violent, and be accompanied with putrid symptoms, it will be advisable to administer Peruvian bark liberally, and to obviate costiveness, by gentle laxatives. One of the most effectual preventives of this fever is, to place the infant to the breast as early as possible; a practice which cannot be too strongly recommended; as the life, or at least the health, of many valuable mothers might be spared, if such method were more generally

followed. The apartment ought to be carefully aired; and, if the breasts abound with milk, at the commencement of the fever, they should be occasionally drawn; thus, that fluid might effectually be prevented from acquiring an unnatural acrimony, or from being absorbed, while in a corrupted state.

Violent passions and affections of the mind must be studiously avoided by those who suckle children; for such irregularities not only lay the foundation of the most painful disorders in mothers or nurses, but also injure the innocent babes, by inducing painful, and often fatal diarrhœas. In every instance, after sudden fright, or a fit of passion, it will be advisable to squeeze, or gently agitate the breasts, in order to discharge the redundant milk, before the infant be permitted to suck. Lastly, if the breasts become turgid, and there be an apprehension of the milk coagulating in them, shortly after parturition, it will be requisite to present them to the infant; provided it be sufficiently strong: in the contrary case, another child or adult should draw them, and thus diminish the superfluous and hurtful part.

MILK-HOUSE, a building designed for the reception and preservation of milk, previously to its undergoing the various processes of the dairy.

As we have already, under the head of DAIRY-HOUSE, treated of the utensils, &c. proper for the management of milk, we shall now lay before our readers a cut, representing a milk-house, upon an improved plan, by the industrious Dr. ANDERSON.



Description of Dr. ANDERSON'S MILK-HOUSE, *with its appurtenances.*

The uppermost of the three figures represents a section of the whole structure.

A, the dairy in the centre, surrounded by open passages.

B, the entry to the dairy from the north.

C, the ice-house.

D, the scullery, or wash-house, with the door or entrance from the south, and benches placed beneath.

f, a door, which communicates with the milk-house, &c.

h, the fire-place.

The lowermost of the three figures, is an elevation of the milk-house A.

B B, the passages round it.

c, the interior window.

d, the ventilator or air-pipe.

g, the exterior window.

The smallest of the figures above given, is a delineation of the ventilator.

i, represents the valve at the top.

k, another valve at the bottom, which communicates with the milk-house.

n, a similar valve, with the passage.

The whole of this structure ought to consist of a range of narrow buildings, as in the section first delineated, where the middle division marked A, represents the *milk-house*, properly so called. Dr. ANDERSON directs it to be built with a double wall, so that a current of air may continually pass, for the purpose of preserving a regular, cool temperature; the inner wall being constructed with lath or bricks, doubly plastered on both sides; and the outer one, consisting of plaistered lath: both being carefully worked, so as to render them perfectly air-tight.

The entrance to the dairy ought to be on the north side B; but it will be requisite, for greater convenience, to make another communication through the door *f*, into the front room, especially during the winter, when the outer door B, should be kept continually shut. The external roof ought to be constructed with tiles, or slate, while the inner one should be made of plaister, closely applied. Between both, it will be necessary to leave a vacant space, at least four feet wide, for the free passage of air, as delineated in the elevation above given; in which the letter A, represents the inside of the *milk-house*. The letters B B, designate the area between the two walls, that gradually diminishes towards the top, till it terminates in the ventilator or wooden chimney *d*; which ought to be constructed, on three sides, with planks or boards lined with plaster; the fourth, or south front, should consist wholly of glass, carefully closed with putty, so as to render it completely air-tight. Its dimensions may vary at pleasure, from one to two feet in diameter, internally; but it should be elevated at least six or eight feet above the roof; as its effects will be more or less powerful, according to its length.

This tube is furnished at the top with a valve *i*, placed immediately beneath the air-holes, which may be closed when required; and at the bottom is a similar valve *k*. The lower pipe, which communicates with the milk-house, is considerably smaller than the upper tube just described. The opening *m*, is closed on one side; and at *n*

is a valve, which, when shut, prevents any communication between this pipe and the external area..... Farther, the top of the ventilator is covered with boards, placed in the form of a roof, so that the rain may be thrown off, without impeding the current of air; while, by means of the valves above-mentioned, the air, heated by the action of the sun through the outer wall, will immediately escape, thus constantly preserving a due temperature; and, by the same means, all damp and confined air, which is extremely pernicious in dairies, will be constantly expelled.

The building is furnished with a window placed along the slanting interior roof at *e*, and which is closed down with putty, to prevent it from being opened. Another window, *g*, is fixed over it in a similar manner on the external roof, so as to transmit the light without impeding the current of air between the two glasses.

The passage round the milk-house ought to communicate with the external air below, only at the threshold of the door B. But it will be necessary to make a small aperture on every side, about one foot in height from the floor, in order that such area may be occasionally ventilated. Each of these apertures should be secured with a piece of thin wire-work, in order to prevent the approach of insects, or other vermin; and ought likewise to be furnished with a door, or cover, by which it may be opened, or closed, according to circumstances. Farther, if this passage be furnished with shelves, and lighted by a glazed window from the inner apartment, so as to admit *light only*, it may be advantageously econvrted into a pantry for keeping butter, cheese, &c. perfectly cool, independently of its use for preserving the temperature of the milk-room.

The whole of the interior apartment should be furnished with hard plaster neatly smoothened, and totally devoid of ornament, so that it may be cleaned as often as becomes necessary. In its centre, Dr. Anderson directs a large stone table to be placed, being about 2½ feet high, 3 feet wide at the least, and of a breadth proportioned to the length of the room. Beneath the table is to be fixed a stone trough, corresponding to the length and breadth of the former, and being about one foot deep, that is, six inches above and below the floor of the milk-house. From the bottom of the trough, a pipe is to be conducted, for the purpose of carrying off the water: and, in case it be supplied by a running stream, it will be requisite to make one side of such trough somewhat lower, that the water may run over, and thus be carried out of the house. The floor of the building should be constructed with stones neatly laid; and, if these be easily attainable, the shelves, delineated in the elevation above given, should be hewn out of the same materials: otherwise, they may consist of wooden planks.

If the milk-house be situated near a large town, where ice could be vended during the summer, Dr. Anderson is of opinion, it would be very beneficial to the owner, to erect an ice-house contiguous to this dairy, as represented at the letter C, in the uppermost cut above given. He recommends it to be surrounded by a double wall on three sides, with a passage or area intervening, as in the dairy.

The receptacle for the ice ought to be formed of upright posts, lined with wattled-work of wands, or with close rail-work, but so as to leave a walk two feet and a half wide every way; round which a gutter should be made to carry off such water as may drain from the ice. This is, in his opinion, the cheapest method of building an ice-house, in any situation; and is far preferable to the usual mode of making vaults, which are not only more liable to be damp, and become mouldy, but are also far more expensive, and by no means so well calculated to preserve a gentle coolness, and an equal temperature, at every season.

The apartment, marked with the letter D, is designed as a repository for the utensils of the dairy, in which they may be cleaned and arranged. For this purpose, it will be advisable to place shelves round the walls, together with tables, and such other articles as may be found necessary. Its entrance should be from the south, where the roof projects about two feet over the wall, as at *f*, which door communicates immediately with the milk-house, and may be occasionally opened in the summer; but which alone ought to be used during the winter, when the chief entrance B, should be constantly shut. At one end of this apartment is a fire-place, on which a cauldron, proportioned to the size of the dairy, ought to be fixed; in order that there may be a continual supply of warm or hot water.

Such is the outline of Dr. ANDERSON'S ingenious plan, which appears to be well calculated to enable attentive dairy-men, to keep their milk of an equal temperature at all seasons, while they may, at the same time carry on the necessary operations with little trouble or expense....Those of our readers, who wish to become more intimately acquainted with the whole economy of the milk-house, will not without instruction peruse Dr. ANDERSON'S *Practical Remarks on the Management of the Dairy*, which were originally published in the 5th vol. of the *Letters and Papers of the Bath Society*; but which have been considerably enlarged in the 3d vol. of the new series of his valuable miscellany, entitled *Recreations in Agriculture*, &c.

[The following cut (Fig. 1.), represents the ground plan of a milk-house, at the farm of Mr. J. MILLER, Chester county, a plate of whose excellent barn was given under the article, FARM-YARD.

The trough A, surrounds the platform B, and both are made of rubbed marble slabs, set in Tarras cement; and the joints *well joggled*: the water is admitted by a leaden pipe C, which is inserted three inches below the nozzle of a pump near the house. The pipe at D, is level with the platform and conducts the water off when it rises as high as the platform; thus affording a continual change of water. The milk stands about two feet six inches below the surface. The platform is five feet wide: the deepest part of the trough, is six inches, and the shallowest four inches. The trough extends thirty-five feet round the platform, and is one foot eight inches wide. There are two small opposite windows in the house, E E, a little above the surface. The scale of the cut is $\frac{1}{4}$ of an inch to a foot.

By *joggling*, is meant the leaving a ridge on one edge of the stone, and a channel on another, to receive it.....See Fig. 2.

Figure 1.

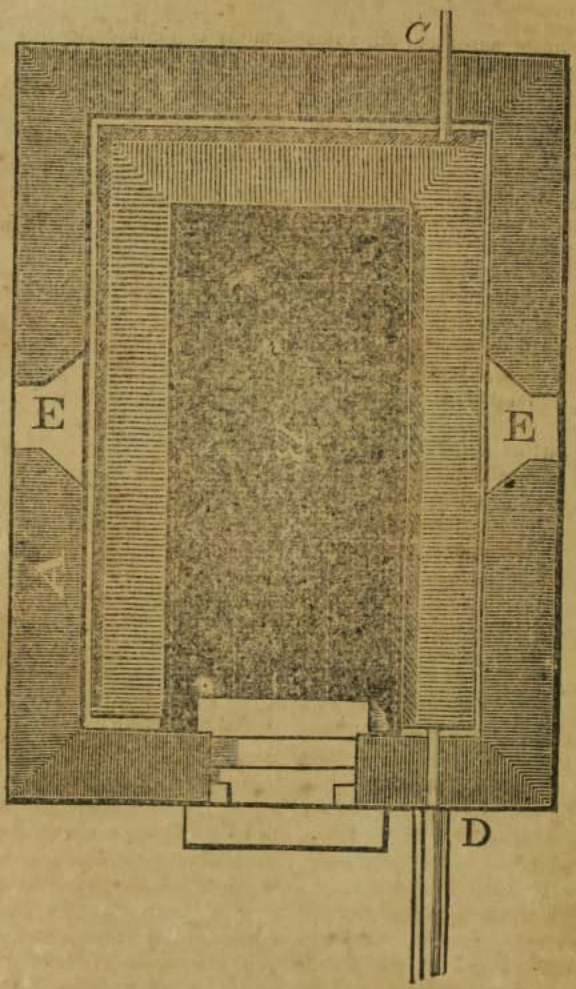


Figure 2.

MILK-THISTLE, or LADIES' THISTLE, *Carduus marianus*, L. an indigenous plant, growing on ditch-banks, road-sides, the borders of cornfields, and on rubbish: it flowers in the month of August. Though often a very troublesome weed in pasture and other lands, the milk-thistle may be eaten in the spring as a salad: and the tender stalks, if peeled and soaked in water to extract their bitterness, afford a delicious dish: the scales of the flower-cup may be used as a substitute for artichokes; and the roots, as well as the leaves, while young, are wholesome food. Rabbits, likewise, are exceedingly fond of the leaves and stalks of the milk-thistle, which tend to preserve their health, when kept in a domestic state.

MILK-VETCH, or *Astragalus*, L. a genus of indigenous, perennial plants, consisting of 80 species; the principal of which, is the *glycyphyllos*, Common or Sweet Milk-vetch, Liquorice-vetch, Wild-liquorice, or Liquorice Cock's-head: it grows in meadows, pastures, and on ditch-banks, where it flowers in the months of June and July....This plant will thrive with uncommon luxuriance in poor barren soils; and yield an abundance of tender and succulent herbage. Its cultivation has therefore, been strongly recommended by Dr. ANDERSON, who observes, that it would be an excellent winter fodder for cattle, which devour it with avidity. Cows depastured on this plant, are said to yield an abundance of rich milk; from which circumstance it has received its most proper English name.

MILK-WEED, the MARSH, WILD PARSLEY, or WILD MILKY PARSLEY, *Selinum palustre*, L. an indigenous perennial plant, growing in damp and marshy situations, where its stalk attains the height of three or four feet; and flowering in the month of June or July. Every part of this vegetable, on cutting it, exudes a milky juice: its aromatic root may serve as a substitute for exotic spices in medicine, and for culinary purposes: the Russians use it instead of ginger, and the Laplanders chew it in the same manner as tobacco.

MILK-WORT, the COMMON, or *Polygala vulgaris*, L. an indigenous perennial plant, thriving on heaths and dry pastures; flowering in the months of June and July. ....This herb is eaten by cows, the milk of which it remarkably increases; also by goats and sheep, but is refused by hogs. Its roots possess an extremely bitter taste, together with all the virtues of the American rattlesnake-root. According to DU HAMEL, it is given with success in pleuretic cases, operating as a purgative, emetic, and diuretic. A spoonful of the decoction, made by boiling an ounce of the herb in a pint of water, till one half be evaporated, sensibly promotes perspiration, as well as expectoration, and has therefore been used with advantage in catharrhal fevers and defluxions on the lungs:...three spoonfuls of this medicine, taken every hour, have sometimes afforded considerable relief in dropsical cases.

MILL, a machine for grinding corn, &c. of which there are various kinds, according to the different methods of applying the moving power; such as water-mills, those worked by horses, wind-mills, &c.

In September, 1801, a patent was granted to Mr. ZACHARIAH BAR-

RATT, for a portable mill, designed to grind corn; and which may be worked either by wind, water, or horses. This contrivance differs from the common mills, chiefly in the following particulars: 1. That its size may be enlarged, or reduced according to circumstances; the whole running on castors; 2. The mill-shaft is moved by a crown-wheel, containing 3 notched orbits, each being at some distance within the other; and which wheel may, by a slight alteration, be constructed so as to be set in motion, either by sails, by horses, or by water; and lastly, the machine may, if required, be conveniently erected at the gable end of a barn. A more particular account of this mechanical invention is given in the 16th volume of the "*Repertory of Arts*," &c. where the apparatus is illustrated with an engraving.

Another patent has lately been granted to Mr. THOMAS WRIGHT, for a *Hand Stone Corn Mill*. The frame of the machine is three feet square, and three and a half feet in height: the stones are 18 inches in diameter, and are inclosed in a tub, supported by two cross-bearers. Beneath these stones, there is a lever, in which is inserted an iron pin; that passes through the centre of the bed-stones, and communicates with various machinery, that sets the whole in motion. Our limits not permitting us to detail its constituent parts, we can only add, that a drawer containing three sieves is placed under the stones, for the reception and sifting of the meal. The price of this mill is 16, or, with the drawers and sieves, 17 guineas: and the machine is asserted to grind six bushels of grain in one day, with perfect ease. A farther account of Mr. W.'s ingenious contrivance may be found in the 38th vol. of "*Annals of Agriculture*," where his description is illustrated with an appropriate plate....See also WATER-MILLS.

[Mills for grinding grain, and for sawing timber, have been much improved within a few years past in the United States. The principal improver of grain mills, is Mr. OLIVER EVANS, of Philadelphia. It would be impossible by any description, or even by engravings, to convey an accurate idea of these improvements; we must therefore refer those who may be anxious to inform themselves respecting them, to a mill in which they are constructed, or to Mr. E.'s "*Miller's and Mill-wright's Guide*." Philadelphia, 1795, in which they are amply detailed, together with a variety of other useful matter respecting the erection of mills. It may be sufficient for the present, to state, that his improvements consist of the invention and various applications of the following machines, viz.

1. The elevator,
2. Conveyer,
3. Hopper boy,
4. Drill,
5. Descender;

Which five machines are variously applied in different mills, so as to perform every necessary movement of the grain and meal, from one part of the mill to the other, or from one machine to another, through all the various operations, from the time the grain is emptied from the waggoner's bag, or from the measures on board the ship, until it is completely manu-

factured into superfine flour, and other qualities, and completely separated, ready for packing into barrels. All which is performed by the force of the water, without manual aid, except to set the different machines in motion ; and serve to lessen the labour one half.

Many mills in the state of Pennsylvania, and Delaware, have been constructed upon the plan of Mr. EVANS ; but they are in the fullest operation at the extensive mills of Messrs. ELLICOTS, near Baltimore, who have added other improvements tending to perfect the grinding, and to the diminution of manual labour. Indeed, the editor has been assured by an observing gentleman, who has travelled much in the old world, that more complete mills than Mr. E.'s are not to be seen in Europe.

In the 19th vol. of the transactions of the *London Society of Arts*, (1801), Mr. GARNET TERRY, of London, describes a hand-mill for grinding hard substances, which is simple in its construction, and may be applied to a variety of useful purposes, especially in the country ; the editor has therefore, given a plate of it. See the last plate in volume iii. The front of the mill is taken off, in order to shew its interior construction.

DESCRIPTION.

A, The hopper, the receptacle of the articles which are intended to be ground.

B, A spiral wire, in the form of a reversed cone, to regulate the delivery of them.

C, An inclined iron plate, hung upon a pin on its higher end : the lower end rests on the grooved axis D, and agitates the wire B.

D, The grooved axis, or grinding cylinder, which acts against the channelled iron plate E.

F, A screw on the side of the mill, by means of which, the iron-plate E, is brought nearer to, or removed further from the axis D, according as the article is wanted finer or coarser.

G, The handle, by which motion is given to the axis.

H, The tube, whence the articles, when ground, are received.

Mr. TERRY says, he has made one on a large scale, and finds it answers the purpose of reducing to powder, coffee, bones, beans, peas, malt, barley, &c.

Family mills for reducing wheat to flour, have lately been introduced into England; and Dr. WILLICH describes that invented by T. RUSTALL, mill-wright of Purbrooth-heath, near Portsmouth; but the description has been omitted, because such mills are useless in this country, where water-mills are within an hour's ride of almost every farmer. A plate and description of the machine may be seen in the 18th vol. of the transactions of the above society.

Mr. JOHN JACKSON, in the entertaining *Journal of his Route from India to Hamburgh by land*, London, 1799, p. 275, says, " On the river *Danube*, below Pest, are many floating corn-mills, which are admirably adapted for the purpose. The vessels on which the mills are built, are always kept afloat, and at anchor, in the middle of the stream ; the wheel is turned by the current." Such mills might be advantageously used on the rivers of the United States.]

MILL-REEK, a dreadful disease, caused by the poisonous fumes of melted lead, which affect not only those who are employed in the smelting or preparing of that metal, but likewise all who reside near the mines whence it is dug, or contiguously to the furnaces, &c. where it is worked.

On the first attack of this disease, the patient feels a weight and uneasiness in the region of the stomach, and a slight degree of colic in the bowels: the pulse is low; the appetite impaired; the legs become feeble, and the whole body is debilitated. Sometimes these symptoms abate in consequence of a slight diarrhœa; though, if the latter continue for some time, it is always attended with danger.

At first, however, the patient is not prevented from following his usual occupations; but, if the disorder progressively increase, and he neglect to apply for relief, the next symptoms will be, obstinate costiveness, violent pain in the intestines; a troublesome giddiness, insensibility, and delirium. The extremities become convulsed; the pulse intermits; and, at length, the highest degree of palsy, or apoplexy, closes the distressing scene.

As the *mill-reek* is of a similar nature and origin with the *Devonshire-colic*, of which we have already treated under the article LEAD, we refer the reader to p. 75, of the present volume, where he will find a short account of its most successful treatment. We cannot, however, conclude this article, without recommending the following precautions (from the first vol. of the Edinburgh *Essays and Observations, physical and literary*, &c. 8vo. 1754) to the attentive consideration of the humane. It is a duty incumbent on all those persons who are in any manner connected with the manufacture of lead, or who reside in the vicinity of lead-mines, to spread and inculcate the means of rescuing many industrious members of society from a most painful death; or, if a person be attacked by this terrible disease, to contribute their share towards preserving them from feeling its extensive horrors.

1. No labourer should be suffered to repair to his work, *fasting*; his food ought to be fat and oily, and it would be very beneficial, if he were to drink a glass of sweet oil, either pure, or mixed with a little brandy, every morning.

2. It will be advisable to take some aperient physic, not only in the spring and in autumn, but likewise, as often as any symptoms of the mill-reek, however slight, are perceived.

3. No spirituous liquors should be allowed, or at least, be very sparingly used, especially while the labourer is at work, or immediately after it.

4. No workman in a state of perspiration must expose himself to the cold air; but he should retire to his home, as speedily as possible; and, after having changed his clothes, cool himself gradually.

5. Immediately after the labourer returns from his work, he ought to take some nourishing aliment, which should principally consist of fat broths, or similar liquids.

6. The diet should be wholesome and nourishing; because scanty or poor food disposes such persons to be more frequently affected, and renders them too feeble to undergo a complete cure.

Lastly, as often as their employment will permit, they ought to visit an open country, where they may breathe an untainted air, and find provisions free from the noxious fumes of lead. Particular care must, however, be taken not to venture upon long journies; because such persons will be more fatigued, and reduced, by travelling one day, than by labouring two days in the lead-mines.

MILL-STONE, signifies the large circular stone, by means of which, when put in motion by machinery, corn is ground into flour.

The diameter of the common mill-stones is, in general, from five to seven feet, and their thickness varies from 12 to 15 or 18 inches. They usually endure 35 or 40 years; and, when they have been employed for a long time, so as to be considerably diminished, they are *edged*, or cut anew, in order to communicate to their surface a figure contrary to that which they originally bore; afterwards the upper mill-stone is made the lower, or bed-stone.

These stones are an article of extensive utility, and were formerly imported in great numbers from France: the *Burr-stones* of that country having been found harder and more durable than any that were dug out of British quarries. To prevent the national expense incurred by such importation, the Patriotic *Society for the Encouragement of Arts*, &c. offered a liberal premium for the discovery of a quarry of mill-stones similiar to the *French burrs*; which desirable object was attained in 1799, by Mr. Richard Bowes, of Conway, in North Wales, to whose widow the Society, in 1800, voted the reward of 100*l*.

The quarry which Mr. Bowes discovered, extends to a very considerably distance from the town of Conway. The stone dug from it, appears, from its external characters, to consist of quartz and cherts. When first taken out of the soil, it is much softer, and more easily wrought into its proper shape, than after it has been exposed to the air, though only for a day. The vein in the quarry contains every variety of the stone, whether cellular, close, hard, or soft, and runs to such a depth, that the industrious discoverer considered it as *inexhaustible*.

Numerous certificates from the most respectable persons have been sent to the Society above mentioned, all of whom agree in stating, that the Conway-stone will form a very valuable substitute for, and answer every purpose of, the French *burr-stone*.

In the year 1796, a patent was granted to Mr. Major Pratt, for his invention of a method of manufacturing a composition-stone, calculated for grinding corn, and various other articles, in the same manner as is effected by the common mill-stones. His artificial compound is stated to consist in mixing certain proportions of siliceous and argillaceous earths (that can only be ascertained by practice), with about one-seventh part of calcareous earth. These are exposed to a fire, heated to the degree usually required in calcining lime, for the space of twenty-four hours, or such farther period as experience alone can determine; after which the composition may be formed into durable stones, that

are said to afford proper substitutes for those compounded by Nature.

MILLET, or *Milium*, L. a genus of plants, consisting of five species; of which the following are the principal; namely:

1. The *panicum*, or Common Millet; which is a native of India, and seldom cultivated in Britain, except in gardens, for the sake of its small round seed, that affords grateful food to poultry. It may, however, be easily propagated, by sowing it in the beginning of April, upon a warm dry soil, but not too thick; because the plants, when growing, expand, and require much room. Hence they should be kept clean from weeds, at their first shooting up. In August, the seed attains to maturity; but, if exposed to the depredations of birds, they will devour it as soon as it begins to ripen. There is a variety of this species, called the *African Millet*, the culture of which has been recommended by M. Tschiffeli, of Switzerland. It flourishes in every soil, requires neither rich manures, nor laborious tillage; and it is not devoured by birds, nor does it exhaust the soil, though affording very abundant crops. Another variety of this species is the *panicum germanicum*, cultivated in Germany and the south of Europe; and which, according to M. Buse, of Erfurt, thrives in a good clayey soil, where it sometimes produces more than a thousand-fold returns.

2. The *effusum*, Millet-grass, or Soft Millet; which is a native of Britain, grows from five to six feet in height, in moist shady woods; and flowers in the months of May and June. This plant is very beautiful; and, though it has no useful property to recommend it to the industrious farmer, yet it deserves to be cultivated in shady gardens, on account of its fragrant odour. Its seeds are eaten with great avidity by linnets.

Besides its utility for feeding poultry, millet is highly esteemed for making puddings, and by many preferred to rice. As an article of food, however, it is by no means equal either to blanched oats, or barley, and ought not to be eaten by persons whose organs of digestion are weak, or impaired.

MINERAL KINGDOM, an expression comprising all bodies that are dug out of subterraneous places, or *mines*, being totally inanimate, and devoid of the power of vegetation.

From the preceding definition it is obvious that *minerals* are *inorganic* substances which, like organized bodies, have a certain origin, progressively increase, and are subject to dissolution, or a decomposition of parts. But they arise merely by an accumulation of homogeneal, or similar particles from *without*, namely, either by substances combining in consequence of their attractive power, which process of Nature is called *cohesion*; or by the solid particles being separated from the fluid ones, when the former attract each other, according to certain laws, constituting together a solid body; and this is termed *crystallization*, a form of which only certain minerals are susceptible. Most metals, however, are supposed to take their origin from the contact or accumulation of *mineral* or *subterraneous fumes* and *vapours*; because the latter, which float in mines and metallic veins, at length penetrate into the particular fossil exposed to their action, and produce *ore*; or,

they combine, each according to their peculiar species, and afford *native* metal.

With respect to the origin of minerals, it is probable that, in some kinds of them, a *gradual* refinement and change takes place within the bowels of the earth. It is also remarkable that, in the southern hemisphere, there is a greater profusion of precious metals; and these are nearer the surface of the earth, than in the northern regions.

Minerals increase in bulk only while they remain undisturbed in their natural situation; but, by exposing them to the air for a sufficient length of time, they are decomposed, or crumble to pieces, without strictly decaying, such as is the case with organized bodies.

Mineralogists divide the mineral kingdom into four classes, namely,

I. Earths and stones.

II. Salts.

III. Inflammable bodies; such as sulphur, bitumens, amber, rock-oil, sea-coal, &c.

IV. METALS.

Of these, however, we cannot in this place attempt an analysis; as, according to our plan, we give concise accounts of the more useful mineral bodies, in their alphabetical order.

MINIUM. See *Red* LEAD.

MINERAL WATERS, include all such fluids as are naturally impregnated with heterogeneous matter, which they have dissolved within the bowels of the earth, whether sulphureous, metallic, or saline; and, as many of these are successfully employed in medicine, they have received the appellation of *medicinal waters*.

Mineral waters have been divided into *hot* and *cold*, from their being either sensibly hotter or colder than the atmosphere. They have also been classed, according to their predominant ingredients, into *acidulous*, *alkaline*, *martial*, *sulphureous*, &c. It is not, however, our design to enter upon a minute investigation of their constituent parts; but, as the analysis of mineral springs may, to many inquisitive persons, afford a pleasing recreation, independently of its real utility, we shall subjoin a few rules necessary to be observed in making such experiments.

I. All experiments ought to be conducted near the spring, if it be practicable.

II. The situation of such spring, the nature of the soil, and the contiguous rising grounds (if any occur) should be carefully examined.

III. With the view of analyzing the water, it will first be necessary to observe the changes it may spontaneously undergo, as well as the various parts, or matters, into which it may separate. For this purpose, it will be advisable to fill several shallow but large cylindrical glasses at the well, or spring, which should be immediately examined by the taste, eye, and smell: after which they ought to stand at rest for two, three, or more hours, or even as many days. At the end of this period, the investigation must be repeated: the fluid compared with water newly drawn from the spring, and if any separation of parts take place, any scum arise, or sediment be formed at the bottom of the glass, they ought to be carefully collected for future examination.

IV. These glasses should next be deposited in a warm place; till, the watery parts being totally exhaled, a dry substance only remains; which ought to be compared with

the sediment obtained from the same water by evaporation over the fire, in order that the real difference between both dry substances, may be more precisely ascertained.

V. It will next be requisite to analyze the water *chemically*: for this purpose, a certain portion of it ought to be taken from the spring, and poured into a retort with a wide neck, to which a clean glass receiver, well luted, should be affixed. The whole must now be placed over a moderate fire, so as to simmer the water till all the aqueous particles are *come over*; when the vessels should be suffered to cool, the distilled water carefully drawn off, and deposited in a well-closed glass: then the dry substance must be separated from the bottom of the retort, weighed, and likewise preserved in a glass.

VI. The distilled water must next be examined by various tests, to ascertain whether it materially differ from distilled common water; or whether it be impregnated with any saline or mineral particles, similar to those observed in the natural fluid, when first drawn from the well. In this process, if the water contain any common salt, it will, with a solution of silver, assume a white colour: if vitriol of iron be one of its ingredients, it will become black, on being mixed with pulverized galls.

VII. In case the water be suspected to contain any salts, it will be advisable gently to boil a quantity of the dry substance obtained by distillation, in five or six times its weight of pure common distilled water, such as is totally divested of all mineral particles. By this process, the saline matter will be dissolved or suspended in such water, in the form of a solution, which, on being filtered, and evaporated to dryness, will re-produce its salt. And, if there should be other salts in the same solution, they may all be obtained, by repeating the filtration and evaporation.

VIII. After the different salts are thus evolved, it will perhaps be attended with some difficulty to ascertain those species which are denominated *neutral*. This may be effected by observing the appearances assumed by such salts, on being mixed with other matters. Thus, marine, or sea-salt, may be known by the white vapour which it emits when in contact with oil of vitriol, and also by its taste, as well as by its cubical figure, on being crystallized. Another distinguishing characteristic of neutral salts is, their property of producing or regenerating sulphur, when mixed and liquefied with salt of tartar, and pulverized charcoal. If, therefore, two parts of such salt be mixed with one part of salt of tartar, and a similar portion of carbon in powder, and the whole be melted in a crucible, a reddish mass will be formed, possessing an alkaline sulphureous taste, and which will communicate a deep yellow or orange colour to rectified spirit of wine.

Lastly, if there remain any matter, after these various operations have been performed, it is generally denominated an *earth*, which, by repeated ablutions in pure distilled water, may be divided into various kinds of species, such as calcareous, siliceous, bolar, or ochreous, &c. These may be still farther examined by the test of fire; and, according to the appearance they assume, on being exposed to that element, it may be easily discovered whether they are

vitrescible, or capable of being converted into glass; whether they will calcine, or become a species of lime: or, whether they will yield any metallic substance. Such is the method by which the analysis of mineral waters ought to be conducted; and it is only by a strict observance of the rules above stated, that chemists have been enabled to enrich the world with numerous discoveries in the mineral kingdom.

As mineral waters frequently contribute to the recovery of health; and as many persons are prevented from resorting to the place, whence such fluids are obtained, various experiments have been made, with the view of procuring them by art, and communicating to them all the properties of the natural waters. The most complete of such chemical processes appears to be that of M. Goldschmid, who has established a manufactory of factitious waters, at Paris, in imitation of the natural springs of Seltz, Spa, and Sedlitz, which have in all respects been found equal, or superior to those celebrated wells. His preparations have undergone a rigid examination by the ablest chemists, both with respect to their physical properties, and the nature of the salts employed. According to the reports of Buillon-la-Grange, and Chaussier, M. Goldschmid's artificial waters are very clear and transparent, possessing a strong acid flavour, and communicating a deep red shade to the tincture of turnsol. On being placed in contact with various re-agents, these compounds, when mixed with lime-water, produced abundance of carbonate of lime; with caustic alkalies, neutral salts; and, when poured on the filings of the purest iron, they acquired, in a short time, a ferruginous taste.

With respect to the carbonic acid, or fixed air, it appears that the factitious waters contain of it *twice and a half of their volume*, which is considerably more than the natural springs.

The advantage of these ingenious preparations are stated to be, 1. That they are not liable to be affected by rainy weather, as is the case with the natural water, which is remarkably influenced by the season. 2. That they do not part with any gas and other volatile constituents, by conveyance, and by keeping them for some length of time; and 3. That the natural fluid can hold in solution only such a proportion of metallic ingredients as the acids and gases contained therein, are capable of dissolving; while the factitious mineral waters are not only cheaper and more efficacious, but retain their virtues without diminution, are impregnated with a larger volume of gas, and may be composed of any quantity and quality of salt or earth, according to particular circumstances. Lastly, they are far more convenient to the purchaser, being much stronger than the natural waters, so that there will be no occason to drink such large and nauseating doses, as are usually taken of the latter.

MINT, or *Mentha*, L. a genus of plants comprising 24 species. 12 being natives of Britain; of which the following are the principal:

1. The *Pulegium*; See Pennyroyal.

2. The *Arvensis*, or Cornmint; growing on moist heaths, pastures, and in sandy inundated

fields; flowering from June to September....It is eaten by horses, and goats, but disliked by sheep, and refused by hogs and cows; though the animals last mentioned devour it eagerly towards the end of the summer, when pressed by hunger, and the pastures are bare; in which case it prevents the coagulation of their milk, so that it is with the greatest difficulty converted into cheese.

3. The *viridis*, or SPEAR-MINT, which grows on the banks of rivers, and in watery situations; flowers in the months of July and August....It is propagated by parting the roots; and, as its flavour is more agreeable than that of most other species of this plant, it is generally preferred for culinary purposes. The leaves of the Spear-mint, when prepared with sugar, form a delicious conserve; and the distilled waters, both spirituous and simple, are highly esteemed for their mildness and pleasant taste. The leaves are eaten in the spring as a salad; and their juice, when boiled with sugar, is formed into lozenges.

4. The *Piperita*, or PEPPER-MINT, growing in watery places, and on the banks of rivulets; flowering in the months of August and September. Its stem and leaves abound with minute vesicles containing a very pungent essential oil, that rises in distillation.....This species is the strongest and most aromatic of the mints, on which account it is alone used in medicine, and the liquor prepared from it, is known under the name of *Pepper-mint-water*. Being an excellent stomachic, it is but too often used in cases of impaired appetite, flatulence, colics, nausea, and inclination to vomit. It has also occasionally been found of service in hysteric affections; and, however harmless in itself, when considered as a *simple* water, this *exhilarating carminative* is so far a dangerous domestic medicine, as with many nervous and irritable persons, it is apt to introduce a habit of *tasting* the stronger spirituous liquors.

MISSELTOE, the COMMON, White Misseltoe, or Missel; *Viscum album*. L. a parasitical plant growing on Apple and Pear-trees, the Hawthorn, Service, Oak, Maple, &c.; flowering in the month of May.

From the berries, as well as the bark of this plant, good bird-lime may be prepared; and, if the former be rubbed, when fully ripe, on the bark of almost any tree, they will adhere closely, and produce plants in the succeeding winter.

Fieldfares and thrushes eat the Misseltoe berries, the seeds of which pass through them unchanged, and along with their excrements adhere to the branches of trees, where they vegetate....No art has yet induced the Misseltoe to take root in the earth. Sheep eagerly devour this plant, which is frequently cut off the trees for them, during severe winters; nay, it is even said to preserve these animals from the *rot*.

Professor BOCK, in his *Natural History of Prussia* (vol. iii. p. 367, Germ. edi.), informs us, that poor people have often, in times of scarcity, collected and dried the stalks and branches of the Misseltoe; then pulverized and mixed them with rye-flower; and thus obtained nourishing bread, which was by no means unwholesome. Professor LEONHARDI, in a similar work,

observes that the Misseltoe, or birdlime, when combined with soapboilers' suds, affords a good substitute for soap, and is alike soluble in water and spirit of wine.

MITE, or *Acarus*, L. a genus of insects, consisting of 35 species, the principal of which is the *Asiro*, Common, or Cheese-mite. It is very small, and when first hatched, is so extremely minute as to be scarcely perceptible by the naked eye. Though principally infesting cheese, there are several varieties of this species, breeding in flour, meal, &c. and occasioning considerable injury. The most effectual method of expelling these noxious vermin is, according to Leeuwenhoek (who was indefatigably attentive to their generation and growth), to place a few nutmegs in the sack, or bin containing the flour, as the odour of that spice is insupportable to mites: which will thus be removed, without the meal acquiring any unpleasant flavour. Funke advises a cheaper remedy, consisting in the decorticated thick branches of the lilac or elder-trees, which are to be put in the flour, and will answer both as a preventive; and for their expulsion.

There are other species of mites, that breed in animals when unclean or filthy, especially in dogs, cows, &c. nay, even on insects. Nor is the human body exempt from their invasion, particularly when infected with the itch (or other eruptive disease), of which they are by many considered as the cause; mites having been frequently found in the watery pustules which occasion that peculiar itching sensation. In dysentery, also, these vermin have been ejected with the feces; whence it is evident that they live and prey on the interior parts of the system.

Mithridate. See Venice Treacle.

MITHRIDATE-MUSTARD, or Bastard-cress, *Thlaspi*, L. a genus of plants comprising fourteen species, six of which are natives of Britain: the principal of these is the *arvense*, Smooth Mithridate-Mustard, Treacle-Mustard, or Penny-cress. It grows in corn-fields, especially in muddy soils, and flowers in the months of June and July.

The whole plant has the flavour of garlic; and its seeds possess the acrimony of mustard. It is, nevertheless, eaten by goats, hogs, and cows, to the milk of which it imparts an unpleasant taste; but is refused by horses and sheep.

MOISTURE denotes a property peculiar to certain bodies that absorb humidity from the atmosphere; such are, sugar, salt, sponge, &c. but which again exhale the watery particles, when exposed to a drier air, or a warmer temperature.

The moisture of the air has a considerable effect on the human frame. Thus, if the quantity and quality of the food, together with the proportion of meat and drink, be ascertained, the weight of the body will be less, and the discharges will consequently be greater, during dry than in wet weather; because the humidity of the air communicates itself to the fibres of the skin; and by lessening their vibratory motion, diminishes the insensible perspiration.

A patent was granted, in 1795, to Mr. James Willson, for his invention of a mode of preventing, in a very material degree, the ef-

fects of moisture on the human body; and of facilitating relief in inflammatory and spasmodic complaints, arising from humidity, as well as from other causes. The curious reader will consult the 12th vol. of the *Repertory of Arts*, &c. where a full specification is given, and illustrated with an engraving.

MOLASSES, or MELASSES, the gross fluid matter, which remains after refining sugar; and which cannot by simple boiling be reduced to a more solid consistence than that of common syrup, vulgarly called *treacle*.

In Holland, this article is chiefly used in the manufacture of tobacco, and by the poor people as a substitute for sugar. A kind of brandy is prepared from it in this country, in considerable quantities, by dissolving a certain portion of molasses in water; fermenting it with wine-lees; and distilling the whole over a moderate fire. This spirit is, however, generally adulterated in such a manner as to render it extremely pernicious to the consumer; but as it tinges the hands, or any substance immersed in it, of a fine yellow colour, it may, we conceive, be more advantageously converted to the purposes of dyeing.

Molasses likewise form a wholesome and agreeable beverage, when prepared as a kind of BEER, of which we have already given an account, in our first volume..... Farther, this thick fluid may be divested of its mawkish taste, and thus rendered fit to be used as a substitute for sugar. We select the following process from CRELL's *Chemical Annals* (vol. i. part 2. 1798, in German), published from the experiments originally made by M. LOWITZ: Let 24lbs. of molasses, a similar quantity of water, and six pounds of charcoal coarsely pulverized, be mixed in a kettle, and the whole boiled over a slow fire. When the mixture has simmered for the space of half an hour, it must be decanted into a deep vessel, that the charcoal may subside; after which the liquid should be poured off, and again placed over the fire, that the superfluous water may evaporate, and restore the syrup to its former consistence. Twenty-four pounds of molasses thus refined, will produce an equal quantity of syrup.

This method has been successfully practiced, on a large scale, in Germany; and, we conceive it might be advantageously imitated; for the molasses thus become sensibly milder, and may consequently be employed in various articles of food. For dishes, however, in which milk is an ingredient, or for cordials which are to be mixed with spices, it will be preferable to make use of sugar.

MOLE, or *Talpa*, L. a genus of quadrupeds, consisting of seven species, of which the *Europæus*, or European Mole, only is found in Britain. It abounds in all parts of Europe, excepting Ireland.

This animal is from five to six inches in length: its head is large, without any external ears, and its eyes are so very minute, and concealed in the fur, that it is vulgarly believed to be blind.

The mole chiefly frequents meadows, gardens, and moist fields that are exposed to the sun, especially on the approach of rain; when it does considerable damage, by loosening the fibres and roots of vegetables, while constructing its

subterraneous abode. The female produces from four to six young at a time, which are deposited in nests, artfully made with moss, leaves and dried grass, beneath the largest hillocks of the field... These dwellings are formed with admirable ingenuity, consisting of an interior hillock, surrounded with a ditch, that communicates with several streets, bye-ways, and galleries.

Various means have been contrived for extirpating *moles*, such as irrigating the fields infested with them, &c. but the most effectual is that described by Dr. Darwin, in his *Phytologia*, and derived from the experience of a successful mole catcher. This man commenced his operations before the rising of the sun, when he carefully watched their situation; and, frequently observing the motion of the earth above their walks, he struck a spade into the ground behind them, cut off their retreat, and dug them up.

As moles usually place their nests much deeper in the ground than their common habitations are situated, and thus produce an elevation, or a *mole-hill*, the next step is to demolish such nests by the spade; after which the frequented paths must be distinguished from the bye-roads, for the purpose of setting subterraneous traps. This will be effected by marking every *new* mole-hill with a slight pressure of the foot, and observing the next day, whether a mole has passed over it, and effaced such mark; which operation must be repeated two or three mornings in succession, but without making an impression so deep as to alarm and induce the animal to open another passage.

The traps must now be set in the frequented paths, and ought to consist of a hollow wooden semi-cylinder, each end of which should be furnished with grooved rings, containing two nooses of horse-hair, that are fastened loosely in the centre, by means of a peg, and are stretched above the surface of the ground, by a bent stick or strong hoop. As soon as the mole passes half way through one of these nooses, and removes the central peg in his course, the curved stick rises in consequence of its elasticity, and thus strangles the animal.

The method above detailed being ingenious, it deserves to be generally adopted; as those, whose grounds are infested with moles, may easily extirpate them, to teach the art to their labourers. It is, however, in our opinion, an undecided point, whether these little quadrupeds, that live entirely on worms and insects, of which they consume incalculable numbers, are not to be considered as harmless, nay useful rather than noxious; especially as they have their formidable *natural* enemies in foxes, martins, weasels, hedge-hogs, serpents, and cats. Farther, it has been observed, that fields and gardens, where all the moles had been caught, abounded with vermin and insects. But, if these burrowing creatures become too numerous and hurtful to the vegetation of plants, or dangerous to dykes and banks, the most easy method of destroying them is, to expose a few living lobsters in a deep glazed earthen vessel, the top of which is somewhat narrower than its basis, so that they cannot escape: such a pot must be buried several inches deep in the ground, and covered

with green sods, so as to be accessible to the mole, which is remarkably partial to that shell-fish. No sooner has one of the former entered the pot, than others from the vicinity will hasten to the fatal receptacle, in consequence of the noise made by the captive; and thus meet with inevitable destruction.

MOLE-CRICKET, or *Gryllus gryllo-talpa*, L. a destructive insect, in the vicinity of rivers, infesting moist meadows, and gardens, in which it does great injury to the plants and roots; destroying whole beds of cabbages, flowers, &c. It is produced from an egg, and furnished with wings similar to those of the common cricket, together with a pair of fore-feet resembling those of a mole, and with which it works its way beneath the soil, raising up ridges in its subterraneous progress, and defacing the beauty of garden-walks. No method has hitherto been discovered of preventing the depredations of these pernicious vermin. But, as the generality of crickets are particularly averse to the fetid exhalations of hogs'-dung, it is highly probable that the *mole-cricket* may be expelled, though not extirpated, by spreading this kind of manure upon infested lands.

MOLE-PLOUGH. See DRAINING, vol. ii. [And PLOUGH.]

MOLTEN-GREASE, a disorder in horses, consisting of a fat or oily discharge with the fæces: it arises from a colliquation or melting down of the animal's fat, in consequence of violent exercise in hot weather.

This disease is always attended with fever, heat, restlessness, starting, and tremblings, great sickness, shortness of breath, and sometimes with inflammatory symptoms. The horse rapidly becomes lean, and, if it survive this attack, commonly grows hide-bound; his legs swell, and continue in that state, till the humours are in a more natural condition; but, if the disorder be neglected, the farcy, or an obstinate surfeit, generally succeeds, and which is with difficulty removed.

The first step towards effecting a cure of this malady, ought to be profuse blood-letting; an operation which should be repeated, though in smaller quantities, for two or three successive days. Immediately after these evacuations, two or three rowels should be introduced, with a view to promote a large drain; while cooling emollient clysters are administered, to abate the fever. The drink should consist of warm water or gruel, with cream of tartar, or nitre, in order to dilute or attenuate the blood; which, in this case, is greatly disposed to become clotted, and to engender a total stagnation of the fluids.

When the fever has abated, and the horse has recovered his appetite, the following mild purgative should be given once a week, for some time, till the disorder be entirely removed: Take of Socotrine aloes 6 drams, of pulverized gum guaiacum ½ an ounce, of diaphoretic antimony and powder of myrrh, each 2 drams; form the whole into a ball with syrup of buckthorn. While this medicine is operating, the horse's labour should be suspended for two or three days every week: thus, he will lose neither his flesh nor appetite, but improve in both; be-

cause this ball is, on the whole, preferable to any other preparation for that purpose.

MOLYBDOENA, a mineral that is frequently confounded with *black-lead*; though possessing properties widely different from the latter. It is of a laminated texture, or formed of plates which slightly cohere; are somewhat greasy to the touch, and soil the fingers; leaving, on paper, marks or traces of a dark-grey colour.

This metal has, hitherto, been found only in Sweden, Germany, Carniola, and the Alps. It is of a light lead-grey shade, sometimes shaded with red, or streaked with a blueish grey. It is insoluble in the sulphuric and muriatic acids; though, in a boiling heat, it tinges them green; effervesces with warm nitric acid, leaving a grey oxyd or powder undissolved: and also with soda, to which it imparts a reddish pearl-colour.

Molybdœna is at present extremely scarce; but, should it ever be found in abundance, it will certainly be of great utility both for dyeing and painting. If one ounce of the perfect oxyd of molybdœna, be boiled with sixteen ounces of water, till the liquor is reduced to one-third; then filtered, and half an ounce of it poured into a small glass vessel, containing ten grains of tin-filings; and next, if four drops of the muriatic acid be added to this mixture, and the whole be suffered to stand at rest, a fine blue colour will be speedily produced, which rises from the bottom; gradually acquires a deeper shade; and is, at length, deposited in the form of a blue powder.

A beautiful *blue lake* may likewise be obtained, by precipitating the solution of muriat of tin, by means of dissolved molybdat of pot-ash, if both solutions be previously diluted with a considerable proportion of distilled water. This precipitate is called by RICHTER *blue carmine*; and, we conceive, might be of eminent service to portrait-painters.

MONEY, a piece of metal, which by public authority bears a certain weight and value, so that it may serve as a circulating medium in commerce.

Money is, in general, divided into two kinds, viz. *imaginary*, or money of account; and *real*, or effective. The former class includes such as never was coined in *specie*; and, though a certain term for expressing it has been invented or retained in different countries, with a view to facilitate the stating of accounts, by keeping them on an uniform basis, yet this ideal money is not liable to be changed in the same manner as current coins, which are raised, or lowered, as the exigencies of the State may require. Of this nature, for instance, are the *Pound*, *Shilling*, and *Penny*, as well as the nominal monies of other countries.

Real money comprehends all coins or species of gold, silver, copper, &c. which do exist and are commonly current. Such are eagles and half-eagles, in gold; dollars, half-dollars and quarter-dollars, in silver, and cents, in copper.

MOON, in astronomy, one of the heavenly bodies, usually, though erroneously, classed among the planets; for it is with more propriety considered as a satellite, or secondary planet.

The mean distance of the moon from the earth, is computed by as-

tronomers, to be about 240,000 miles: her diameter is as 100 to 365, that is, about 2,180 miles.

The moon appears to us under various forms; being sometimes horned, at others semi-circular; then full and round. Sometimes this celestial body increases; at others, it is on the wane; illuminating the globe we inhabit, at certain periods throughout the whole night, at others only for a few hours..... The cause of these appearances is believed to arise from the moon being an opaque dark body, which shines only with the light she receives from the sun; hence only the part turned towards that luminary can be illuminated, and consequently transmit light; as the other side is involved in its native darkness. These phenomena, however, it is not within our province to explain: and, as the inquisitive reader will doubtless consult the profound writings of MASKELYNE, HERSCHEL, and other astronomers, who have devoted their sleepless nights to the observation of this satellite, we shall not enter into any farther details....See also ASTRONOMY.

Formerly, the moon was believed to possess considerable influence on the human body; but such opinion, though sanctioned by the name of MEAD, and other eminent physicians, is now generally exploded. This luminary, however, greatly influences the vegetable creation, and likewise appears to affect quadrupeds, especially horses. It is well known, that these useful animals are subject to a weakness of the eyes (particularly when they are somewhat advanced in years); and that such debility increases, or decreases, according to the course of the moon; whence they are said to have *moon-eyes*. Thus, in the wane, they are dull and muddy, or troubled; but on the approach of the new moon, they re-assume their former lustre. No remedy has hitherto been discovered for this affection, which generally terminates in total blindness.

MOOR, or MOOR-LAND, a black, light, soft soil, remarkably loose, without any admixture of stones, and containing a very small proportion of clay, or sand.

This earth usually forms the uppermost stratum of fen-lands, and consists almost wholly of pure vegetable matter, which renders it very fertile. Moors, however, are subject to inundations, and they retain moisture for a considerable time, so as to render it difficult for cattle to graze, without poaching the soil. To remedy this inconvenience, the tenants of such lands, pare and burn them at certain seasons of the year; by which process their nature is considerably improved, as the surface readily takes fire, and burns freely.

In other respects, the conversion of moors into arable or pasture land, varies little from the method already stated under the article MARSH; provided such tracts of ground be in a plain, or on a level. It will be advisable, however, to plant the black willow preferably to any other tree or shrub; as it flourishes well on moors, and affords an excellent shelter to cattle during stormy weather. The course of crops that has been found most profitable, is, for the first three years' grass; that is, hay-seeds, and the different kinds of clover, sown after the surface has been burnt and ploughed in: during the next three years, two crops of corn, with an intermediate fallow. By

such rotation, lands that were naturally of little value, have been rendered fit to produce very beneficial crops.

But, where moors occur in mountainous situations, Mr. YOUNG recommends them first to be drained and irrigated, as the water will work numerous passages round the heath, that is usually found in moorlands; but which will speedily perish when flooded, and will be succeeded by sweet grasses, and other useful plants.

The next step will be to inclose the land with a double, dry stone-wall, between which young oaks, alders, ash, holly, mountain-ash, &c. may be advantageously planted; for, independently of the immediate shelter thus afforded to cattle, they will, in the course of a few years, become very profitable woods. In some cases, a simple inclosure has, without farther cultivation, been found very beneficial for feeding the common Scotch wethers which are distinguished by black faces and legs, and long coarse wool.... Mr. YOUNG observes, that mountainous moors, if tolerably well covered with heath, intermixed with spots of sedge, rushes, and coarse grass, will support a sheep on an acre, throughout the year; and, as the rot seldom occurs on these lands, it has been found, that flocks pastured on them without the addition of hay, thrive well, and oftentimes better than those which are regularly foddered. If, however, the design be to establish a grass-farm, it will be advisable to pare, burn, and *lime* the lands, after which they must be once thinly ploughed, that the lime and ashes may not be too deeply buried.

As the cultivation of mountainous moors is either productive of great profit, or of total ruin, the greatest judgment is requisite in fixing the course of crops. The chief object being to convert these soils ultimately into good meadows, or sheep-walks, the tillage ought only to extend to the destruction of spontaneous growth; to the removal of the acidity peculiar to peat soils, and to support a flock during the winter: which purposes may be effected by paring and liming judiciously, and also by sowing hay....The first course, which Mr. YOUNG considers as deserving more particular attention, is:

1. Turnips, or cabbages.
2. Oats.
3. Grasses, *mown*.
4. &c. Grasses, *fed*.

This course is generally preferable to others; but, in case it should be found inadequate, he recommends the following variation to be adopted, viz.

1. Turnips or cabbages.
2. Cabbages or turnips.
3. Oats.
4. Grasses, mown.
5. Grasses, fed.

Such rotation is, in Mr. YOUNG's opinion, far superior to that in which turnips, &c. and oats, are sown twice alternately, previously to laying down grass-seeds; because the grass is thus defended one year; whereas two alternate crops of oats too much exhausts the virtues of the manure, before the grass-seeds are sown; while the turnips, &c. being fed on the land, return to it, by the dung of the cattle, comparatively more than they derive or take from it.

As there are extensive wastes in various parts of England, which consists of moors, capable of being brought into a high degree of cultivation, the patriotic *Society for*

the Encouragement of Arts, &c. has, from time to time, offered premiums for improving them.... Large tracts of land have, in consequence, been rescued from a state of nature; but the most considerable improvement appears to be that effected by JOHN MIREHOUSE, Esq. of Brownsdale, Pembrokeshire, on whom the Society, in 1800, conferred their gold medal; and whose merit we have incidentally mentioned, under the article DRAINING.

The quantity of land thus recovered, was 274 acres, situated between two hills, which extended nearly two miles in length: it was formerly a common, so completely inundated, as to be of little or no value. The lord of the manor having obtained an act of parliament for its inclosure, Mr. MIREHOUSE proposed to take a lease, on condition that the proprietors should cut a drain, and lay down a tunnel; which being accordingly executed, a lease was concluded, and Mr. MIREHOUSE proceeded to complete the drainage.

He formed a channel on the north side, and divided the land into 12 pieces by double ditches, of such a depth as the fall would allow, from a few inches to four feet: between the ditches, a space of about 30 or 40 feet was left for planting willows. The soil appeared a perfect sponge; and, as soon as the drains began to take effect, it sank so considerably that, after frequently lowering the ditches, the surface of the water remained nearly the same distance from that of the land. Having repeatedly sunk the principal drains and ditches, he at length obtained above three feet from the water to the surface of the land, *in the lowest parts*; and, in others, a level sufficient for his purpose.

The common being thus inclosed and divided, Mr. MIREHOUSE commenced the draining of each division, by small internal cuts, about twenty inches wide at the top, and of various depths, to three feet and a half, reducing them to six inches at the bottom; leaving those open which were in the direction of the plough, and filling up others with brush-wood. Both these drains answer to his entire satisfaction; and he observes that the whole common has been converted from a state of waste into excellent land, for the sum of 508*l*.

We regret that our limits do not allow us to detail the course of crops pursued by this truly "Practical Agriculturist;" let it therefore suffice to conclude, that barley and oats have seldom succeeded; but the wheat raised on this land, has been very abundant, and the grain weighty: cole-seed has also been cultivated with great advantage, as a winter food; the crops having in general been very fine, and enabled Mr. MIREHOUSE to feed great numbers of sheep during the space of four months, from January to April; and to fatten them much sooner than he had ever been able to effect, on turnips of the best quality, produced on his *home-grounds*. In short, the land from being of no value, has already been very productive; and Mr. MIREHOUSE thinks it will, in a short time, become the most valuable meadow of the neighbourhood. The vegetable substance thus drained, has become a fine luxuriant black mould, to the very surface of the waters, and is daily losing its sponginess, and acquiring greater cohesion.

MORDANTS, or MORDICANTS, in dyeing, signify those substances, which are employed for the purpose of macerating the stuffs, and rendering them capable of imbibing the tinging matter. Of this nature are, the sulphat of alumine: acidulous tartarite of pot-ash; the solution of tin in nitro-muriatic, and oxygenated muriatic acids: the vegetable astringent principle, or gallic acid; acetite of alumine; sulphat of copper, or blue vitriol; arsenic; acetite of copper, or verdigrease; and the sulphat of zinc, or white vitriol.

Mordicants act on stuffs in two different ways: 1. By parting with a portion of their oxygen, in consequence of which the substance of such stuffs is changed, and their attraction for the pigment or colouring matter is increased; and, 2. By altering, in a similar manner the nature of the pigment, and rendering it capable of coagulation. Thus the colouring matter undergoes several changes, and receives various degrees of a lighter or darker shade.

It would exceed our limits, to point out the different mordicants, which are adapted to certain colours, or to particular stuffs; for these can be only ascertained by experience. But as the fine Turkey *red* communicated to cotton by means of madder, depends principally on the mordants employed in that process; and, as the knowledge of these is involved in considerable obscurity, by the jealousy or avarice of dyers, we shall subjoin a few hints on their effects in dyeing cotton red, selected from the memoir lately published by M. CHAPTAL, in the "*Annales de Chimie.*"

The three principal mordants used in this operation are, oil, galls, and alum.

The greatest caution is necessary in choosing the *oil*, which ought to be similar to that employed in painting, and to contain a large portion of the *extractive principle*. Hence, this oil should not be completely saturated with the alkali; but previously to giving the red dye to the stuff, it ought to be combined with a weak solution of soda (or of potash, if the former alkali cannot be easily procured;) and the cotton duly impregnated with this preparation; by which every part of it will thoroughly imbibe the oil. The next process is that of *galling*, for which purpose, galls only should be employed, as no other vegetable astringent is equally efficacious.

The last mordicant is *alum* which not only possesses the property of brightening the red tint produced by madder, but at the same time contributes, by its decomposition, and the fixity of its earth or aluminous base, to give solidity to the colour. In order to judge of its effects in dyeing cotton, it will be sufficient to mix a decoction of galls with a solution of alum. The mixture will immediately become turbid, and a greyish precipitate be formed, which on being dried, is insoluble both in water and in alkaline ley. Great care, however, is requisite, that the aluminous solution be not *too hot*; lest part of the astringent principle, obtained from the galls, escape from the cotton, and the alum be decomposed in the immersion; a circumstance by which the power of the mordant is necessarily diminished, and the colour is impaired.

It is, therefore to be attributed wholly to the *united effects* of the three principles (oil, the astringent principle, and the earth, or base of alum,) which serve as a mordant in dyeing red with madder. If these be employed separately, they will neither produce the same fixity, nor afford a similar brilliancy of colour.

MOROCCO-LEATHER, the skins of goats tanned and dyed in a peculiar manner by the Turks; but which processes were originally invented in the kingdom of Morocco.

The skins are prepared in parcels, consisting of 36, divided into six bundles, which are folded in the middle, lengthwise, and thrown into a pit full of lime, whence they are taken out, rinsed in pure water, drained, and suspended in the shade to dry, till the hair becomes loose. After carefully taking off the latter, the skins are returned to the lime-pit, for two or three weeks, when they are again rinsed, and passed repeatedly through a decoction prepared of 30lbs. of dog's-dung, and an equal quantity of water. As soon as the skins are thus gradually impregnated, they are thrown into a large vessel for the space of twelve hours, after which they are cleaned with pure water, and immersed for seven or eight days in a watery decoction made of bran.

The skins are now wrung, and thoroughly washed in clear water, to render them soft and pliable: next they are cured, by spreading a thick layer of common sea-salt, in the proportion of about half a pound to each skin, and piling them up, till they are rendered sufficiently supple. The last process which the skins undergo, previously to being dyed, is immersion in a liquor prepared by boiling 24 ounces of dried figs, for each skin, in a copper (we believe, treacle would answer the same purpose,) in which they remain till they are about to be suspended in the air for drying: lastly, they are dipped in a solution of alum, that disposes them for the immediate reception of the dye.

The chief colours communicated to Morocco-leather, are *red* and *yellow*, for the preparation of which, the Turks have long been celebrated.

The *red* colour is prepared by mixing together various articles, in the following proportions, which are required for a parcel of 36 skins:

	Drams.
Cochineal - -	130
Round suchet (crocus indicus)	45
Gutta gamba - -	15
Gum-arabic - -	10
White alum, pulverized -	10
Bark of the pomegranate-tree	10
Citron juice - -	2
Common water -	120lbs.

The alum is gradually added to the other articles, which are thrown into a copper, where they should be boiled for about two hours, till one-tenth part of the water be consumed. In this mixture the skins are repeatedly immersed; and, when sufficiently imbued with the colour, they are dried, and again steeped in a vessel, containing three pounds of hot water (for every two skins) together with one pound of sumach, and a similar quantity of gall-nuts, pulverized and sifted....As soon as the skins are completely impregnated with this liquor, they are slightly rubbed over with a sponge dipped in pure water, and suspended,

without being folded, on a wooden frame, for about three quarters of an hour, to drain. They are now carried to a river, or in running water, where they are repeatedly rinsed, then pressed with weights, in order to extract the moisture, and hung up in a warm room to dry.....The last process which red Morocco leather undergoes, is that of polishing: this is effected by means of various wooden instruments, that contribute at the same time to remove such of the particles of gall and sumach as may adhere to the skins.

The *yellow* colour is prepared in a manner nearly similar to that just described; the common Avignon or yellow berries *(Graine d'Avignon)* being substituted for cochineal, and employed in similar proportions.

The only variation between the two processes of dyeing *red* and *yellow*, is, that the former is tinged with the colouring matter, before it is *worked*, or polished with the wooden instruments; whereas this operation is performed on the latter, previously to its being dyed.... But these two are not the only colours dyed by the Turks, who likewise manufacture black, green, and blue leather; which last three, however, are not only destitute of lustre, but are extremely perishable. The Turks, indeed, are as inferior to Europeans in preparing the more common species, as they excel them in manufacturing and dyeing the red and yellow moroccos.

MORTAR, a preparation of lime and sand, mixed with water: it serves as a cement, and is employed by masons and bricklayers in erecting walls, houses, &c.

Mortar being an article of extensive utility, it becomes an object of considerable importance to discover such a method of preparing it, together with such materials, as will perfectly cohere, and at the same time resist the action of the weather.

Having already treated, at some length, on this subject, under the head of CEMENT, we shall, at present state some of the most simple methods of preparing strong and durable mortar.

The proportions of *lime* and *sand* usually employed in making the common mortar, are *two* parts of the former to *three* of the latter, which are mixed up with soft water; but its quality and durability will, according to Dr. ANDERSON, be considerably improved, if the lime be slacked, and the sand mixed up with *lime-water*, instead of the common. The reason assigned for this opinion is, that the fluid drawn from wells contains a large portion of fixed air; which, by mingling with the mortar before it is used, reduces the quick-lime into a kind of inert calcareous earth, similar to chalk, and thus spoils the cement. But, if the mortar be worked up in a perfectly caustic state, it attracts the air so slowly, that it concretes into a kind of stony matter, which, in the course of time, becomes as hard as the rock from which the lime-stone was taken.

[The tarras mortar used at the bridge now building over Schuylkill, was composed of "one part tarras, two parts lime, and three parts sand," and was found to harden in a very short time.] See also BUILDING.]

In the year 1777, was published (in French), an ingenious "*Inquiry concerning the Manner in which*

the Romans prepared the Lime they used in Building; as also on their method of mixing and using their Mortar;" by Mr. De LAFAYE..... The principal circumstance appears to be the mode of slacking the lime without liquefying it, so as to reduce it to powder; and at the same time to leave it sufficiently caustic to yield a strong mortar; which, in proportion to its age, will acquire additional strength.... To effect such object, it is requisite to select good fresh lime, made of hard lime-stone, which is to be broken into pieces of the size of an egg. These should be placed in a shallow open basket, which ought to be plunged into water, till the surface of the fluid begin to boil. The basket is then drawn out, and suffered to drain for a short time; after which the lime is put into casks, where it speedily grows hot, and crumbles into powder.

The lime thus prepared, is to be mixed with various compositions of mortar, according to the purposes for which they are designed. It may be preserved for a considerable time, and will retain its useful properties, by simply covering the casks with straw. M. GUYTON states, in a late volume of the *Annales de Chimie*, that he employed this lime, 18 years since, in the construction of a small aqueduct, which was intended to convey water to an artificial nitre-bed. The mortar consisted of equal parts of the following three ingredients, namely, sand, fragments of calcareous stone, and lime slacked according to the directions above given: in a short time, it acquired an uncommon degree of firmness, which has remained unimpaired since that period.

[The propriety of the above directions of Dr. A. are confirmed by the experience of the gentlemen composing the building committee of the permanent bridge now erecting over the Schuylkill at High-st. who inform the public in their late publication respecting the progress of the work, that the mortar used in cementing the stone work, was made by "throwing sand into a bed of the wash of slacked lime, which then received an addition of sand, till brought to its proper consistence for use." The proportions were three parts of coarse sharp sand, and one part of lime: richer mortar was found to diminish the strength of the cement.

On the subject of making mortar, Dr. A. further says; it is of importance that much water should be used, and that it be retained as long in the mortar as possible, and accounts for the superior strength of the ancient mortar from its greater fluidity, and the slow manner in which it dried.

2. It is impossible to ascertain the due proportion of sand for making the most perfect cement, owing to the more or less degree of calcination of the lime-stone; and it may be added, the quality of the sand used; which varies very much.

3. The best modern mortar Dr. A. ever saw, was made of lime, which he had analysed, and found it contained eleven parts of sand to one of lime; to this there was added between twice and thrice its whole bulk of sand by measure, which may be allowed to have been at least three times its quantity by weight; or, not less, than 47 parts of sand to one of lime. This mortar was used for pinning the outside joints of the

stone walls of a house, in a tempestuous climate, and in 21 years, exhibited no appearance of falling.

4. When lime is to be employed for *plaster*, every particle of limestone should be slacked before it is worked up, as the action of the water upon the undissolved particles of lime would slack them, and produce the excrescenses, called blisters. Hence the lime, if impure, should lie for a considerable time macerating or souring in water, before it is worked up.

Pure well calcined limestone will soon fall, but this *souring* as it is called, should never be omitted. This process, though not essential, in making *mortar*, is still of use, as any dry knots which may fall after the mortar is used, must tend to disunite the parts, and render the cement imperfect. The best burnt lime Dr. A. ever saw, required some days to macerate in the water, before the whole slacked.

Mr. Dossie's directions concerning mortar, are however very different from the above. See our vol. i.

Under the article Cement, reference was made by Dr. Willich to Mr. Loriot's publication in France, "*On cement and artificial stone:*" in which a new mode of making mortar is recommended, viz. by mixing slacked lime with one-third part of its quantity of fresh lime. Dr. A. repeated the experiment several times, with only this difference, that he employed lime that had lain a considerable time *beat up with water, as is usual to allow it to sour*, instead of lime long covered up in a pit, like that which M. Loriot employed; and asserts, that he perceived no greater hardness than in common mortar; and hence, he is induced to think that the uncommon effects observed from the mortar by Mr. L. must have been occasioned by some other unobserved peculiarity, and not merely by the circumstance to which he ascribes it.

The *water* with which mortar is made up, is of great consequence to the perfection of the cement. It should be as free as possible from carbonic acid (fixed air): when, therefore, about to commence a building, we should add to the water supposed to contain the injurious ingredient, an equal bulk of lime-water. If carbonic acid be present, either free or combined, a precipitate will immediately appear, which on adding a few drops of muriatic acid (spirit of salt), will again be dissolved with effervescence.

The water in the pumps of Philadelphia, in general, is impregnated with this air; river or rain water therefore ought to be used.]

MORTIFICATION, or *Sphacelus*, in the animal economy, is generally defined to be a total extinction of the natural heat of the body, or rather of a peculiar part, in consequence of inflammation.

Under the article Gangrene, we have already given some hints respecting the nature and treatment of this dangerous affection, so that we shall at present only add a few supplementary observations.

Mortifications of the external parts, such as the legs and feet, more frequently occur in debilitated persons, and those who are addicted to the use of spirituous liquors; or in the aged, gouty, scorbutic, &c. than in the young and robust.

Beside the means suggested for the removal of this complaint, in article Gangrene, there are *three*

other remedies, which have frequently proved successful.

CARMINATI recommends the external application of the *gastric juice* of animals to the parts affected, in a manner similar to that described in article CANCER.

The late Mr. POTT, after having experienced the inefficacy of the Peruvian bark in the cure of mortifications, accidentally discovered that *opium*, taken in pretty large doses (one grain every three or four hours), first procured a remission from the great and continual pain which the patient felt in his foot and ancle; and then stopped the progress of the disease; but Mr. POTT carefully watched the narcotic effects of this drug; keeping the body open by laxative injections. Thus, the mortified parts were cast off, the bones separated, and a clean sore was produced: while this was healing, the dose of the opiate was gradually diminished, and at length totally relinquished.

The last, and probably most effectual, remedy against this fatal disorder, appears to be the application of *fixed air*, whether by means of filling large bladders, or other vessels, in which the affected limb may be confined; or by the repeated use of *fermenting poultices*.... In the 3d vol. of the *London Medical Transactions*, Mr. JOHN POWER communicates a case, in which all the toes had perished, and the middle of the foot had mortified; but a cataplasm of wheat flour and honey, fermented by the addition of yeast, completely stopped the progress; healed the sore; and the patient, aged 67, recovered her health and spirits.

[Peruvian bark, wine, and other stimulants, are generally associated with the idea of mortification, and when it occurs in debilitated habits, they are certainly proper; but in vigorous habits, or in persons of inflammatory dispositions, the best way to prevent mortification is to lessen the excessive action of the system, by moderate bleeding, cooling saline purgatives or clysters, and light diet.

The internal administration of stimulants where necessary, will be greatly assisted by their external application. In the edition of the *Surgical Tracts* of the late Dr. JOHN JONES, Philadelphia, 1795, p. 137, the editor has recorded a remarkable instance of the efficacy of Peruvian bark, in powder, to a mortified limb, and he can with confidence recommend it. A poultice of flour, honey, yeast and charcoal powder, is also commonly used, and with success in removing the fetid smell of wounds, ulcers, and mortifications.]

MOSCHATEL, the TUBEROUS, or *Adoxa Moschatellina*, L. an indigenous perennial plant, growing in damp woods, and shady places, where it flowers in the months of April and May. The ripe fruit of this low plant has the flavour of strawberries. The plant itself possesses the odour of musk, for which it may serve as a substitute in chests, or drawers, among clothes. Its root was formerly in repute among the vulnerary herbs.

MOSS, in *Botany*, a term for a numerous family of plants, which may be called the dwarfs of the vegetable kingdom.

Mosses were formerly supposed to be a mere excrescence from the earth and trees, yet they are no less perfect plants than those of greater magnitude, having roots,

flowers, and seeds, though no art has hitherto been discovered, to propagate them from the seed.

They are spread over the whole globe, so that in some situations the soil is exclusively covered by mosses; and thus frequently bare rocks gradually become fertile..... As they grow most copiously on the north-west side of trees, it is probable that mosses serve to protect them from the severity of cold; but, if these parasitical plants be suffered to increase too abundantly, they not only tend materially to injure trees, but also to stifle the more useful vegetables of the soil.

Mosses are almost constantly green; have the finest verdure in autumn; and, though kept in a dry place for a whole century, they may be revived, and their colour restored, by immersing them in water.

Dry moss is the most proper substance for mattrasses, and greatly superior to straw; as it is not liable to be infested with mice, bugs, fleas, &c. When such couches become hard by compression, they may be easily raised again and rendered soft, by beating them with sticks. For this purpose, however, the longest and softest mosses ought to be collected, in September, during dry weather; then cleansed from all impurities and woody roots; dried in the shade; and again agitated with a stick, on a hurdle. Next, the mattress is to be stuffed eight inches thick, and quilted in the usual manner. Nor is this soft substance less useful for packing glass, earthern ware, and other brittle articles, in preference to straw, or wood shavings.

Among the numerous *mosses* which are subservient to economical purposes, we shall at present only mention a few of the most useful; because others are inserted in their alphabetical place.

1. *Fontinalis antipyretica*, or GREATER WATER-MOSS, which grows upon rocks and roots of trees; in brooks, rivulets, slow streams, and ponds: it flowers from June to September. According to LINNÆUS, this species resists the action of fire: and, if mixed with mortar for lining the inside of chimnies, it renders them *fire-proof*; as, contrary to the nature of all other mosses, it is almost incombustible. BOHMER also remarks, that a thatched roof, if covered an inch thick with the greater water-moss, will be completely secured against fire.

2. *Bryum rurale*, which grows on roofs, both thatched and tiled, walls, and trunks of trees: it is perennial, and flowers from December to April. Thatched buildings overgrown with this moss, instead of lasting about ten years, will remain sound for a century.

3. *Sphagnum palustre*, or GREY BOG-MOSS, which is also perennial, and flowers in July and August. This species materially contributes to the production of peat or *turf*; so that in process of time, bogs and morasses are converted into beautiful meadows. In Norway, it is employed for filling up the crevices of planks in wooden walls; and though it be sometimes used for a similar purpose in tiled roofs, yet as it affords shelter to vermin, we conceive it might more safely and advantageously be applied behind the stones or brick-work of wells, to prevent the clay or loam from being wasted by the action of the water.

4. *Byssus candelaris*, L. (*Lichen flavus* of WITHERING) or YELLOW POWDER-WORT; an annual vegetable dust generated on old pales, the cracked bark of trees, and antique walls, in all parts of the world: it appears from September to June. This powdery substance may, according to BOHMER, be employed for dyeing a very bright yellow colour.

5. *Lycopodium clavatum*. See CLUB-MOSS, the Common.

MOSS, in *horticulture*, is a disease which greatly impedes the growth of trees, and at the same time very materially injures the fruit of orchards.

The remedy usually employed is, to scrape off the moss with a kind of wooden knife, that will not wound the bark or branches; or to rub them with a strong hair-cloth, immediately after a heavy shower of rain. But the most effectual method, in Mr. BUCKNALL's opinion, consists in washing all the branches with soap-suds, and a hard brush, every spring and autumn. The action of rubbing, he observes, will so far invigorate the tree, as amply to compensate both the labour and expense: the plant will not be injured by this operation, which he directs to be performed in the same manner as a groom curries or scrubs the legs of a horse. [Moist weather should be chosen for this business, as the moss may be then easily disengaged.] The most efficacious preventive, however, is to remove the cause, by draining all superfluous moisture from the roots; and, when the trees are first planted, by placing them on the surface of the ground, and raising a small mound of good fresh mould around them.

The moss, vegetating on shrubs, &c. is of various kinds, according to the nature and situation of the soil. If the young branches of trees be covered with long and shaggy moss, they will speedily perish; and can only be preserved by cutting them off near the trunk; or, by lopping the head of the shrub, &c. if it be found necessary; as it will sprout again with increased luxuriance. In thick plantations, however, and in a cold ground, the trees will always be covered with moss: in such cases they must be thinned, and the land drained, or well stirred.

Where shrubs, fruit-trees, &c. are covered with moss, in consequence of the soil being *too dry*, it will be useful to spread large quantities of river or pond-mud about the root, and to open the ground for the admission of the manure: such expedient will not only cool the land, and greatly suppress the future growth of moss, but at the same time prevent the fruit from falling off too early....a circumstance that frequently happens in orchards planted in very dry soils. Mr. FORSYTH advises moss to be carefully removed in the months of February or March; after which the scraped trees must be washed with a mixture of fresh cow-dung, urine, and soap-suds. If this operation be repeated in autumn, when the trees are destitute of leaves, it will not only prevent the production of moss, but will also destroy the eggs of numerous insects, that would otherwise be hatched; while it contributes essentially to promote vegetation. But, though moss be in general destructive to the vegetation of shrubs and trees, yet, if growing only on the *north side* of their trunks, it is attended with considerable advantage; inso-

much, that it serves both to shelter them from the severity of the north winds, and also to direct the wandering traveller in his course; because it always points out that quarter of the compass.

MOSS, the MARSH, or *Minium*, L. a genus of perennial plants, comprizing 32 species, most of which are natives of Britain. The following only deserves to be mentioned, namely, the *fontanum*, or Fountain Marsh Moss: it grows in low wet meadows, turf-bogs, and springs; where it flowers from May till August. This kind of moss, which may be seen at a considerable distance, serves as an excellent guide for discovering clear and cold springs: wherever it thrives, fresh water may be found, without the trouble of sinking *deep* wells.

MOSS-LAND, an expression used in Scotland, and also in various parts of England, for denoting what is more properly called a MORASS, BOG or FEN.

The *theory* of mosses is foreign to our plan; and as we have already stated the most approved methods of cultivating swampy soils, under the respective heads above mentioned, and also under the articles MARSH and MOOR: we shall now give the substance of an ingenious method of *converting* mosses into rich vegetable mould, proposed by Mr. JOHN SMITH, of Swindrig Muir, Ayrshire, Scotland; who published a small pamphlet on this subject, at Edinburgh, in 1798.

The first step will be to mark out proper main-drains for carrying off all superfluous moisture; at the same time taking care to preserve an accurate level. These drains should be eight feet wide at the top, four feet and a half deep, and gradually contract to two feet and a half in width at the bottom: they serve both to drain the soil, and to divide the field into inclosures, comprising from six to ten Scotch acres.

The ridges are next to be marked regularly, formed with a gentle declivity, and not too high; being six or seven yards in breadth, and worked with a spade in the following manner. A space of about 20 inches, in the middle of each ridge, remains untouched: on each side of which a furrow is made, and turned upon such central spot, so as to cover it completely. The labourer then continues to cut the moss with a spade to the width of about 12 inches, and to turn it over in the same manner as if it had been ploughed, till it arrives at the *division-furrow;* which ought to be about two feet in width, cut out, and thrown upon the sides of the ridges. The depth of this furrow varies according to circumstances; but it should be so regulated, as to answer the purpose of collateral trenches, serving to conduct the water into the main-drains.

All the ridges must now be *top-dressed* with *shell-lime*, in the proportion of from 160 to 200, or 220 Winchester bushels; which should be spread on the land during the summer, and (if possible) immediately after it has been slacked; because the lime, when acted upon by heat, the autumnal rains, and the winter frosts, purifies more speedily, and thus prepares a proper mould.

The first and most beneficial crop to be raised from mosses, will be *potatoes;* for which purpose, beds from five to six feet broad should be marked out in the spring, across the ridges, with intervening

furrows or trenches, about two feet in width. These beds must be covered with a thin layer of dung, on which the potatoe cuttings are placed, about 12 inches asunder; the whole is spread with a thin stratum of moss, that is succeeded by another layer, as soon as the potatoes appear above the surface of the ground. No hoeing or other cultivation is necessary, till the crop be taken up, which seldom amounts to less than 320 Winchester bushels.

When the potatoes are removed, the ridges should be formed a second time, in the manner above described; and the division-furrow cleared out, for the reception of oats, which are sown in the spring, and covered in by means of a small harrow drawn by two men. The amount of the crop is asserted to be, in general, about 60 Winchester bushels, per acre: the grain being in all respects equal to that produced on other soils. So beneficial, indeed, are the effects of lime, in consolidating and ameliorating the moss, that *five*, and even *six*, successive crops of oats have been obtained, without any appearance of its being exhausted; and that often at the end of the second, and always of the third year, it acquires a sufficient firmness to be ploughed by two horses, to within two *bouts* or stitches of the division-furrow. Farther, the seed should be harrowed in by horses: and when the oats are ripe, they may be removed from the field in carts, without the moss sinking, or rendering the carriage difficult.

Such is the outline of Mr. SMITH's method, which deserves to be more generally known, especially in Lancashire, and those counties that abound with morasses or fens. We cannot, however, forget to mention, that some intelligent farmers conceive this mode of cultivation to be practicable only on *shallow* mosses; though, in the essay above cited, Mr. SMITH states that he has successfully practised it with such as were 14 feet in depth.

MOSS-RUSH, or GOOSE-CORN, *Juncus squarrosus*, L. a native perennial plant, growing on heaths and barren turfy bogs; flowering in the months of June and July.... This vegetable indicates a *barren soil*: it is eaten by horses; but, being a very low plant, its leaves adhere so closely to the ground as to elude the stroke of the scythe.

MOTH, or *Phalœna*, a genus of insects comprehending several hundred species, which it would be needless to enumerate: they are uniformly bred from eggs, and are no sooner hatched than they construct for themselves a small habitation, in which they live; and may thus be easily distinguished from other insects, which do not form their *chrysalis* till they are about to change from a caterpillar state into that of a butterfly.

Most moths become nocturnal butterflies; though some species of these vermin, being real maggots, assume the shape of flies; and others that of chafers.

With respect to their abode, they are divided into *domestic*, *field*, and *aquatic moths*. The first is the small lead-coloured moth, that lives on fine furs and woollen goods, by the destruction of which it often occasions considerable damage: the two latter kinds prey on the leaves of trees, the fibres of wood, bark, &c.

The butterflies of the domestic moth are scarcely half an inch in length, and have four long wings

that cover the whole posterior part of their body. From the early spring to Midsummer, they infest our dwellings, and during the night search for convenient places to deposit their eggs, which are scarcely discernible by the naked eye. These are hatched within three weeks, and produce very diminutive caterpillars with sixteen feet, and which immediately begin to weave, for their accomodation, a thin silken cover from their own substance, not unlike the silk-worm, and then gnaw off the wool and hair from the stuffs on which they are settled. Thus arises a cylindrical texture which, being open at both ends, is gradually enlarged with the growth of the insect. In order to extend this fabric, the caterpillar divides it longitudinally into two parts; weaves an intermediate piece between each section; and joins to both ends a small portion for enlarging its abode. The whole has externally the colour of the stuff from which it is taken, and the substance of the latter affords sustenance to the insect.

In this state, they remain nearly a whole year, and during that period greatly injure clothes or other articles manufactured of wool; though these destructive creatures fast for many days (probably when changing their skin), and also spend the whole winter in a torpid state. In the succeeding spring, they entirely close their case; change into a chrysalis; and, after a few weeks, appear in the shape of *moths*, which speedily propagate themselves in the manner of bugs. Some species, however, previously desert their habitation, and suspend themselves, in the next convenient corner, where they undergo their transformation ....There is a peculiar kind of these vermin, called *bastard-moths*, the cases of which are open at one end; closely attached to woolen cloths, and removed only when they have devoured the whole substance around the spot: they are of a larger size than the true moths....Another variety of the latter kind, preys only on the dry skins of animals, the leather covers of books, &c. but their cases are destitute of all motion.

It is remarkable, that moths never infest the fleeces on the backs of animals; nor even *unwashed wool;* so that they always abandon the place where such raw material is kept. Hence those persons, to whom the smell of turpentine is too offensive, may avail themselves of this circumstance, and place layers of undressed wool between pieces of cloth, or put small parcels in the corners of shelves and drawers containing drapery of that description. For the discovery of this curious and useful fact, we are indebted to M. Reaumur.

Another, though more disagreeable mode of exterminating moths, is the smoke of tobacco, which infallibly kills them; but the articles thus fumigated should be afterwards exposed to the air, which speedily dissipates the peculiar smell of that narcotic herb.

Mother-of-Pearl. See Muscle, the Pearl bearing.

MOTHERWORT, the Common, Lion's Tail, or *Leonurus Cardiaca*, L. an indigenous plant, growing in hedges, rubbish, on dunghills, and calcareous soils; flowering from June till August.

The leaves of the Motherwort possess a strong disagreeable

odour and a bitter taste....Goats sheep, and horses, eat this vegetable, but cows do not relish it; and it is totally refused by hogs....Dambourney dyed woollen cloth of an excellent dark olive colour, from a decoction of this plant.

MOULD, a general name for the soft earthy substance that serves as the upper stratum of land; and in which all kinds of vegetables strike root and thrive.

Mould consists of the following ingredients; viz. sand, clay, and talcum, or magnesian earth; carbon derived from decayed vegetable and animal substances; the carbonic acid, and water. The good or bad qualities of the soil depend upon a proper mixture of these ingredients; though, if the carbon, the carbonic acid, and iron, be wanting, the fertility of land will depend on its capacity to retain the quantity of moisture, which is necessary for the nutriment of vegetables.

The relative utility of mould, for the different purposes of the gardener, may be ascertained by the sight, smell, and touch. The best is of a light brown or hazle colour; it cuts easily, and does not adhere to the spade, being light, friable, and crumbling into small clods. The next in quality are the dark-grey and russet-coloured moulds; but the worst are those of a very light, or very dark ash-colour, such as are generally found on barren heaths and commons, where they seldom produce any thing except furze and fern.

With respect to smell, Miller observes, that the best time for judging by that sense, is immediately after rain has moistened the soil; when the mould, if it be rich and good, will emit an agreeable odour. But the most accurate criterion is the *touch*; as it may thus be ascertained whether the mould be too sandy, or abound with too much clay; whether it be fatty and slippery; or harsh, porous, or friable. The most fertile, by this test, holds a medium between the two extremes; being easily soluble, consisting of equal parts of sand and clay; and not adhering to the spade, after gentle showers.

MOUSE, or *Mus*, a genus of quadrupeds, comprising sixty species, of which the following are found in Britain, namely:

1. The *sylvaticus*, or Long-tailed Field-mouse, the length of which is in general from eight to nine inches, including its tail....These animals are found in fields, gardens, and shrubberies, where they do incalculable damage; burrowing under the ground, and digging up grain, acorns, peas, or beans, &c. when newly sown; which they carry to their subterraneous granaries. Their habitations may be discovered by the small mounds of earth, that are raised on, or near, the entrance of their abode; or by the passages leading to their nests, or store-houses; and, by following the course of such passages, the vermin may be easily destroyed.

Another method of extirpating field-mice, is by traps, consisting simply of a flat stone that is supported by a stick; and beneath which is placed a roasted walnut. They are speedily attracted by the smell of the walnut, which they prefer to acorns or cheese; and, as it is fixed to the stick, that yields as soon as it is touched, the stone falls upon them, and terminates their existence. But the most effectual mode of destroying these

animals, would be to encourage the breed of owls, which is so active in the pursuit of nocturnal vermin.

2. The *messorius*, Harvest, or Smaller Long-tailed Field-mouse, which is by some considered as a variety of the former species; and is very small and slender: its whole length, together with the tail, not exceeding 4½ or 5 inches. It chiefly infests the county of Hants, where it is very numerous, especially during the harvest..... This creature constructs its nest of a circular form, with blades of corn, which it deposits above the surface of the ground between the straws of standing grain, and frequently in thistles, where the female produces from six to eight young ones at a time.

The harvest-mice never enter houses; but are often carried into ricks, among sheaves of corn; *one hundred* having sometimes been found in a single rick, on taking it down to be housed. Those remaining in the field, shelter themselves during the winter beneath the ground, into which they burrow deeply, forming their beds or nests, of decayed grass. They may also be taken by means of the traps above mentioned.

3. The *musculus*, or Common Mouse, which has a very long scaly, and almost naked tail; exclusively of which, it is about three inches and a half in length. This species is uncommonly prolific, producing several times in the year, five or six young at a litter.

There are several varieties of the common mouse, which are chiefly distinguished by their colour, such as black, yellowish, spotted, &c.; but the most rare and beautiful are white, with red eyes.....They are in some degree capable of being tamed, especially by means of music, to which all mice are singularly attached.

The common mouse inhabits all temperate climates, and is chiefly found in houses and in barns, whither it resorts for the sake of food, devouring grain, bread, cheese, butter, oil, &c. It is exceedingly timid, and very nimble; never leaves its abode excepting for food; and retires on the slightest alarm.

These little depredators may be destroyed in houses by the common traps, baited with cheese; in barns, it will be necessary to allure them by means of singed leather, grease, or other animal food; and, in chambers where cheese is preserved, with malt-meal. As, however, all these methods are troublesome; and, as the exposing of poisonous substances may be attended with danger, we shall communicate a remedy that is both safe snd efficacious: Take a few handfuls of wheaten flour, or malt-meal, knead it into a dough, and let it grow sour in a warm place; then mix with it finely levigated iron filings, form the whole into small balls, and put them into the holes frequented by mice. On eating this preparation they are inevitably killed.

Another way to extirpate them is, by keeping cats, dogs, owls, or hedge-hogs, in the places infested with mice or rats. But the most effectual method of *preventing* their devastations in barns, the floors of which they frequently undermine, consists in laying beneath the latter a stratum of flints, fragments of glass mixed with sand, or broken cinders. It has likewise been proposed to construct such floors on piers of brick, raised about 15

or 18 inches above the ground, so that dogs or cats may have a free passage beneath the building..... See also CORN, and MULLEIN.

4. The *arvalis*, or Meadow-mouse, is from three to six inches in length; dwelling in bushy places, corn-fields, meadows, and gardens, chiefly near waters. It subsists on nuts, acorns, pease, and grain, which last it prefers to every other kind of food, collecting considerable quantities in its subterraneous residence.

As soon as the corn is ripe, the meadow-mice assemble together in corn-fields, where they commit great ravages, by cutting down the stalks of corn with their teeth, and robbing the ears; nay, they follow the reapers, consume all the fallen or neglected grain, and, when the gleanings are devoured, they flock to the newly sown fields, and destroy the crop of the succeeding year. Being very prolific, the females produce from eight to twelve at a litter, several times in the year. During the winter, they retire to woods, coppices, &c. where they subsist on acorns, hazle-nuts, and the seeds of trees.

In some seasons, the meadow-mice become so numerous, that they would consume every esculent, if they did not destroy each other. Hence, in unproductive years, their numbers are greatly diminished, not only by devouring their own species, but also by becoming the prey of the long-tailed Field-mice, of foxes, wild cats, weasels, and especially of dogs.

MOUTH, in anatomy, a part of the face, comprehending the lips, gums, inside of the cheeks, palate, &c.

The mouths of different animals are admirably adapted to various uses, according to their size and nature; being well formed and calculated for the reception and mastication of food, the seizing of prey, &c. It would however, be incompatible with our design, to enter into any details relative to the organization of this part; we shall, therefore, concisely state only a few of the diseases incident to the human mouth.

1. Affections of the TEETH, and GUMS, which are discussed in their respective places.

2. CANCERS, which see.

3. If the mouth be affected with excruciating pain, the internal application of opium will afford considerable relief. But, if any tumors or swellings arise, it will be advisable to apply externally cataplasms of marsh-mallow, and other emollient vegetables, or poultices of bread and milk. When the tumefied parts continue very painful, without suppurating, it will be proper to lance them, in order to reduce the swelling. The patient ought, at the same time, to avoid speaking: and to take no such food as is either of an acrid and stimulating nature, or requires any efforts of mastication. Hence, he ought to subsist principally on liquid, mucilaginous aliment; and his drink should be sweetened with honey, which in itself is one of the best balsamics....See GARGLE.

MOWING, the act of cutting down grass, &c. with the scythe.

This method of *reaping* has hitherto been practised chiefly on oats, clover, and the grasses; but there is no doubt that it may, with advantage, be extended to wheat, and every other kind of grain; for the following obvious reasons: 1.

Mowing is much easier, and less fatiguing to the labourers than reaping. 2. It is more expeditiously performed. 3. It requires a smaller number of hands. 4. It affords employment for children, aged men and women, who are almost past labour, in gathering the corn, and other lighter branches of the work. 5. The grass being mown together with the straw, the quantity of the latter is increased, while it becomes of greater value as fodder. Lastly, the grass produced on fields which have been mown, vegetates with increased luxuriance, and furnishes excellent pasture for cattle, and particularly for cows, when the harvest is closed. Hence Du Hamel infers, that a farmer may, by this practice, not only keep a larger number of cattle, but at the same time save his hay, and obtain a greater quantity of dung.

It may probably be objected, that, if a wet harvest should occur, *mown wheat* will sprout more speedily than that which is *reaped*..... This injury, however, may be effectually prevented, by disposing the sheaves *triangularly*, so that the head of one may rest upon another. The only requisite to effect this, is a little dexterity is closing the triangle, so that the basis of the third sheaf may serve to support the heads of the first and second.

We cannot conclude this article, without noticing an easy method, by which the operation of mowing may be greatly facilitated. According to the present mode of cutting grass, the workmen trace *two parallel lines* with their feet, which they move forward alternately, after every stroke of the scythe: instead of which, Du Hamel recommends the mower's path to be traced *only in a single line*; because he ought to advance with one foot before the other, in such a manner that the left (which is behind), should always forward the right foot. This simple practice deserves commendation, for the labour will not only be performed with more speed, but likewise with greater ease to the mowers, who will thus be secured from those sudden cramps in their left sides, with which they are frequently seized, in the prevailing system of using the Scythe.

[MOWING-MACHINE. Mr. Moses Coats, whose ingenious contrivance to pare apples, was described under the article Fruit, has lately invented a mowing-machine, which promises to be of extensive utility to farmers. It is drawn by two horses, and takes a swarth four feet nine inches wide, as fast as the horses walk: but he thinks it would work a swarth six feet wide, to better advantage. It cuts grain uncommonly clean, not leaving one stalk standing, nor dropping one by the way, and at the same time lays the grain in regular order for the binder. The irregularity in the surface of most grass fields, prevents the general application of the machine to the cutting of grass, but where this difficulty does not occur, and the ground is clear of stones, it answers fully. The editor has been favoured by the inventor, with a general description of this *labour-saving machine*, but deems it unnecessary to give it, as persons wishing to possess one must apply to the inventor, to whom letters may be addressed, at Downing's-town, *Pennsylvania*.]

MUD, the slime or miry earth usually found at the bottom of

ponds, and stagnant waters. It also signifies the dust or dirt of streets and roads, rendered fluid by rain.

Mud is chiefly used as a manure for *loamy* soils; though it may also be applied with advantage to any other land. The best kind is that taken from ponds which have received the draining of farm-yards. The sweepings of London streets have likewise been found of considerable service, when mixed with a little horse-dung, in order to ferment, before it is carried on the land. Thus prepared, it has been spread in the proportion of ten or twelve loads per acre, and been productive of the most beneficial effects....See MANURE.

MUGWORT, or *Artemisia*, L. a genus of perennial plants, comprising 49 species, five of which are indigenous: among these, the following are the principal.

1. The *maritima*....See WORMWOOD, the Sea.

2. The *Absinthium*, MUGWORT, COMMON WORMWOOD, or WORMWOOD-SOUTHERNWOOD, growing on road sides, rocky places, and on rubbish; it flowers in August..... This herb is extremely bitter; and, if it be infused in wort, as a substitute for hops, it renders the ale very pernicious to health, on account of its intoxicating effects.... On distilling the leaves and flowers, they yield a considerable quantity of essential oil, which is used, both externally and internally, for destroying worms. If the leaves be put into sour beer, they speedily correct its acidity; and being excellent antiseptics, they are often employed in fermentations, to resist putrefaction. According to WITHERING, an infusion of these leaves is a good stomachic; and, with the addition of fixed alkaline salts, proves a powerful diuretic in some dropsical cases. Their ashes produce a purer alkali than most other vegetables. An infusion of the same herb, given to a suckling woman, renders her milk bitter; and, if the plant be eaten by sheep, it also imparts a bitterness to mutton..... Although turkeys are fond of it (on the authority of Mr. HOLLEFEAR), yet it is not relished by horses and goats, while it is refused by cows and swine. If the plant be macerated in boiling water, and repeatedly applied to a bruise, by way of cataplasm, it will not only speedily remove the pain, but also prevent the swelling and discoloration of the part. In dyeing, a decoction of the Common Wormwood produces, with the addition of alum, &c. various shades of yellow; and, if such liquor be applied to bedsteads, chests of drawers, and similar articles, it prevents the generation of vermin. The smoke arising from the lighted bundles of this herb, expells bees from their hives, when honey is to be collected, without destroying these useful insects.

3. The *vulgaris*, COMMON MUGWORT, or SOUTHERNWOOD, which grows on the borders of fields, ditch-banks, and on rubbish; it also flowers in August. This species possessing a more agreeable flavour, is in some countries used as a culinary aromatic: a decoction of it, is often taken by country-people, for curing intermittent fevers. The Chinese employ the fresh plant bruised, for healing wounds: and, according to Dr. HOME, a dram of the leaves, dried and pulverized, if taken four times a day, has effectually removed hysteric fits, after æther and asafœtida

had failed of procuring relief..... Dr. ANDERSON remarks that sheep are very fond of the Common Mugwort, devouring it with great avidity, especially the roots; though according to LINNÆUS, these animals, as well as swine, totally refuse it; and horses, cows and goats do not relish it.

MULBERRY-TREE, or *Morus*, L. a genus of exotics, comprising seven species, of which only the *nigra*, or Common Mulberry-tree, is cultivated in Britain, on account of its black fruit.

It is propagated both by layers, and by cuttings, which last are preferable; because, when judiciously selected, and properly managed, they will speedily strike root. For this purpose, the cuttings ought to be taken from shoots of the preceding year, with one joint of the two years' wood at the bottom, and to be set towards the end of March, in beds of rich light earth, which should be pressed closely around them. If they be placed beneath glasses, their growth will be remarkably promoted; but, if the young plants be exposed to the air, it will be necessary to shelter them from the severity of winter, with moss; a precaution, which at the same time renders it unnecessary to water them frequently. In the succeeding spring, they should be removed to the nursery, and trained to a stem; the more luxuriant branches being carefully pruned, to prevent their too rapid growth; and, in the course of about four years, they may be finally transplanted to the place where they are destined to remain.

Mulberry-trees thrive best in a light, rich soil, and an open situation; for, if they stand too near houses or other buildings, or contiguously to shady trees, their fruit seldom attains to maturity. It will, however, according to the experience of MILLER, be of considerable advantage to defend them from the west, and south-west winds, by trees, or walls, placed at a small distance.

The fruit of this species, if eaten before it be thoroughly ripe, is very astringent; but its syrup affords an excellent gargle, for mitigating inflammations of the throat, and ulcers of the mouth. The berries when perfectly mature, are grateful to the taste; they produce both cooling and laxative effects, while they contribute to allay thirst..... Their juice is employed to impart a dark tinge to liquors and confections, which stain the fingers as well as linen of a red colour, that is very difficult to extract. Spots of this kind, however, may be removed from the hands by verjuice, the acid of sorrel, and that of lemons; but, for linen, the best method is to wash the stained part with warm water, and to dry it with the vapours of sulphur, which immediately remove the spot.

The fruit of the common mulberry-tree, when properly fermented and prepared, yields a pleasant vinous liquor, known under the name of mulberry-wine. Considerable quantities of these berries are likewise consumed in the cyder countries, particularly in Devonshire, where they are mixed with apples, &c. in making a delicious beverage, called *mulberry-cyder*. For this purpose, the ripest and blackest mulberries are selected, and the expressed juice is added to the cyder, in such a proportion as to impart a perceptible flavor. The liquor thus acquires a very pleasant taste, as well as a deep red colour, similar to that of

the finest Port-wine, both of which continue undiminished by age.

The *bark* growing on the root of the Common Mulberry-tree, has an acrid bitter taste, and is a powerful *cathartic*: hence it has been successfully used as a vermifuge, particularly in cases of *tænia*, or of the tape-worm: the dose is half a dram of the powder, or a dram of the infusion. The wood of the tree is yellow, tolerably hard and may be applied to a variety of uses in turnery and carving. It is however, necessary to steep it in water before it is worked: in order to remove the tough and fibrous bark, which is capable of being converted into a strong cordage, ropes, and brown paper.

There are several other species of this tree (particularly the *alba*, or White Mulberry) which are cultivated to a considerable extent on the continent, for their mucilaginous leaves, that afford a most grateful food to silk-worms; but, as various unsuccessful experiments have been made with a view to introduce their culture into Britain, they are seldom raised, excepting by way of ornament, in the hot-houses of the curious. It deserves, however, to be stated, on the authority of Bechstein, and other continental writers, that the last mentioned species is better calculated to withstand the effects of severe frosts than the common Mulberry-tree; that it is, therefore preferably cultivated in the northern parts of Germany, for instance, Saxony, Brandenburg, Pomerania, and Prussia; where it thrives with uncommon luxuriance, if planted in a moderately rich, though sandy soil; and if properly sheltered from the cold north winds. This observation is amply confirmed by the considerable quantities of raw silk annually produced in the Prussian dominions from the leaves of that tree, which afford the most proper nutriment to silk-worms.

[The white Mulberry-tree thrives in the United States, and in Connecticut is much cultivated. The tree grows rapidly, and has been recommended for hedges. Cattle however are so fond of the leaves, that great care would be requisite to preserve the young trees from their depredations.]

MULE, or *Equus Mulus*, a mongrel kind of quadrupeds, partaking both of the nature of a horse and an ass.

Mules are very hardy animals, and therefore much used in warm climates, where they are preferred to horses, for the purposes of either draught or carriage. Considerable numbers are likewise employed in Ireland, and in some of the northern counties of Britain, on account of their great strength and durability.

These animals sometimes attain the height of 15 or 16 hands, though in general, they do not exceed 14. They are calculated for carrying heavy burthens. They are, besides, surefooted, and attain a great age; instances of mules thirty years old, having occurred in Ireland, and which nevertheless, were in the full possession of their vigour.

The mules bred in cold countries, are reputed to be more hardy, and fit for labour, than such as are reared in warm climates..... Hence they deserve to be more generally propagated in Britain. For this purpose, however, it will be

requisite previously to procure a strong male ass, and two females, which should be well fed and kept in good order. Their colts ought, likewise, to be carefully attended, fed, and littered, being kept under shelter in the winter, and the stable-door left open in the summer, that the animals may exercise themselves in the air, for one or two hours, during the middle of the day. By such management, the breed of colts will be considerably improved; and, at the end of three years, the males will be fit for the purpose. The mares selected for the stud, should be young, of a lively turn, small limbed, and with a head of a moderate size. These, with proper attention, will drop foals; each of which, at the age of three months, are said to be worth from ten to twenty guineas.

During the first winter, it will be necessary to *house* the mule colts, so that they may be frequently handled, in order to render them tractable. When three years old, they may be *broken in*, but it will not be advisable to work them to any considerable extent, till they have attained the fourth year of their age; after which time they will, if properly treated, continue in full vigour till they are past thirty, and even forty years. It should, however, be remarked, that *no wheat*, or *rye-straw*, ought to be given them for their food, *whether whole or cut;* as it greatly disagrees with their nature, and incapacitates them for performing hard labour.

Mule, a term which denotes any production, whether of the animal, or vegetable creation, that originates from two different species.

Thus, beside the animals properly denominated *mules*, it appears, that the different breeds of sheep may be advantageously *crossed*. Linnæus observes, that the breed from *Swedish* ewes and *Spanish* rams, resembled the Spanish sheep in wool, stature, and external appearance; but was, in all respects, as hardy as the Swedish sheep: the contrary effect resulted from the Swedish rams and Spanish ewes. He farther remarks, that the English ram *without horns*, and a Swedish *horned* ewe, produced sheep destitute of that ornament. These facts are equally curious and valuable; they require no commentary to recommend them to the attention of breeders in general.

The *vegetable mules* are very numerous; and by scattering the farina, or fecundating dust, over female flowers, several excellent varieties have often been obtained. Thus, in the first volume of the *Letters and Papers of the Bath and West of England Society*, we meet with an interesting account of a *mule-cabbage*, which is said to fatten cattle six weeks earlier than *turnips*. The correspondent states, that the sort of cabbage principally raised, is the Tallow-loaf or Drum-headed cabbage; which being too tender to withstand the severity of the frost, he planted some of this species and of the common Purple Cabbage for pickling alternately: when the seed-pods were perfectly formed, he cut down the purple, and left the other for seed. The result completely answered his expectations; namely, the produce was a mixed stock, of a deep green colour, with purple veins; and which retained the size of the drum-head, while it acquired all the hardiness of the purple. This is one of the most success-

ful experiments with respect to vegetable improvements: and, without quoting other instances, related in the subsequent volumes of the same valuable collection, as well as in other works, we trust these few facts sufficiently evince the practicability of the plan; and hope they will not be disregarded; because such attempts not only tend to enrich our *practical* knowledge, but at the same time afford additional proofs of the wisdom, and beauties of the creation.

MULLEIN, or *Verbascum*, L. a genus of plants, comprising 17 species, five of which are indigenous: the principal of these are:

1. The *Thapsus*, GREAT WHITE MULLEIN, HIGH TAPER, COW'S-LUNGWORT, or LADIES' FOX-GLOVE; growing on chalky and gravelly soils, and on dry ditch-banks; flowering in the month of July. HOCHHEIMER informs us that the roots, stalks, and flowers of this plant, after being properly cleaned of the adhering earth, and other impurities, have long been used in German granaries, where bundles of it are placed in every corner, and on the grain itself, in order to prevent the depredations of *mice*. It affords so complete a security from these vermin, even in barns, that they suddenly disappear, and shun the place for several years after this vegetable has been deposited. According to BECHSTEIN, the root of the Great Mullein, reduced to powder, and mixed with malt-meal, speedily fattens capons and chickens. The herb, in a dry and pulverized state, corrodes the fungous flesh of ulcers; and, if applied while fresh, heals the wounds in the foot of a horse, occasioned by improper shoeing. The flower of this, and the following species of the Mullein, impart a delicate, though not durable, yellow-colour, to wool and cotton; but, on the addition of blue, these stuffs acquire a blue shade of incomparable lustre..... The woody stalks covered with pitch, make excellent flambeaus. The seeds when thrown into water inhabited by fish, produce an intoxicating effect, so that these creatures suffer themselves to be caught by the hand. In Norway, the farmers give the herb medicinally to their cows, when threatened with consumption; and employ its downy fibres as a substitute for tinder. Neither cows, goats, sheep, horses, or swine, will eat this vegetable.

2. The *nigrum*, DARK or BLACK MULLEIN, which grows in hedges, and on road-sides; is perennial; and flowers from July to September....This plant is justly admired for its beauty; the stem is covered with hairs elegantly branched and has yellow blossoms tipped with purple:....Bees visit its flowers, which to them are exceedingly grateful. Swine eat the plant; but it is neither relished by sheep, nor touched by cows, horses, or goats.

MULLET, or *Mugil*, L. a genus of fishes, consisting of two species, principally distinguished by the number of rays in the back-fin. Both frequent the sandy coasts of this island, and particularly small bays that admit influxes of fresh water. Hither they resort in considerable shoals; and, similar to hogs, grub in the sand or mud, leaving their traces in the form of large round holes.

Mullets are extremely cunning: when surrounded with a net, the whole shoal frequently escapes by

leaping over it; for, if one take the lead, the others instinctively follow: but, if they fail to effect their object, they remain motionless in the water, as if resigned to their fate.

In the South of France, abundance of these fish are taken in shallow water, by means of *weirs* constructed with reeds. From the milts of the males, called *alletants*, and the roes of the females, denominated *botar*, the inhabitants prepare a kind of food, called *botargo*. These parts are taken out entire, covered for four or five hours with salt, then pressed between two boards or stones, afterwards washed, and, lastly, dried in the sun for about a fortnight.

As an article of food, the mullet affords a tolerable dish, being more tender than the haddock, and less juicy than the carp: it is not however, so delicious as the ancient Roman mullet, which appears to have been a different species.

MUM, a kind of malt-liquor, which is in great request on the Continent, whence considerable quantities are imported. It is prepared in the following complicated manner: Seven bushels of wheaten malt, one bushel of oatmeal, and a similar portion of ground beans, are brewed in sixty-three gallons of water, which has been previously boiled. The liquor is next poured into a hogshead; and as soon as it begins to ferment, three pounds of the inner rind of fir, one pound of the tops of fir and beech, three handfuls of the blessed thistle, and one or two handfuls of the flowers of round-leaved sundew (*Drosera rotundifolia*, L.), are thrown into the vessel. To these are added a handful of burnet, and a similar quantity of betony, marjoram, avens, penny-royal, and wild thyme; two handfuls of elder-flowers, thirty ounces of bruised cardamom-seeds, and one ounce of bruised berberries. The whole mash is now suffered to work gently for a little time, when the hogshead is filled up, and ten new-laid eggs are thrown in, unbroken; after which the vessel is closed, and, at the end of two years, the liquor is fit for use.

Such is the method said to be practiced at Brunswick, where the best mum in Germany is brewed. The only variation made by English brewers, is the substitution of cardamom, ginger and sassafras, for the inner rind of the fir-tree; and the addition of elecampane, madder, and red sanders.

To those whose palate requires the stimulus of viscid and spicy preparations, *mum* is doubtless a grateful beverage; and a pint of it taken at night, may serve as a sudorific in recent catarrhs and rheumatic attacks. The Germans drink it frequently in consumptive habits; as an opinion prevails among them, that such liquor contributes to obesity, and increases the muscular energy.

MUMMY, in horticulture, signifies a kind of wax employed by gardners, in grafting and planting the roots of trees. It is prepared as follows: Take one pound of black pitch, and a quarter of a pound of turpentine, mix them in an earthen pot, and set the whole on fire in the open air; the mixture should be alternately quenched and lighted, till all the nitrous and volatile parts be evaporated, when a little common wax is to be incorporated with the composition, which is now fit for use.

MUMPS, or *Cynanche parotidea*, a contagious disease, that

chiefly affects the lower classes, and is often epidemic. It is distinguished by an external moveable, swelling, that arises on one side of the neck, but more commonly on both, and frequently attains a considerable size : while the fauces appear red, and the patient has a sensation of straitness. The powers of respiration and of deglutition are somewhat impeded, and the disease is mostly accompanied with a slight degree of inflammatory fever. The tumour increases for three or four days ; when it begins to subside, and, in a few days, totally disappears, together with the fever. Next, it is remarkable, that the contents of the scrotum in males, and the breasts of females, become affected with large hard, and often painful swellings, which generally subside in a few days. Sometimes however, the tumor in the fauces is suddenly suppressed, and not attended with the last mentioned symptom : in which case the fever increases rapidly, is often succeeded by delirium, and has sometimes proved fatal.

The mumps being a disease which commonly terminates without danger, it is scarcely necessary to specify any remedies. The principal requisite is, to keep the head and face warm, to avoid taking cold, and to regulate the bowels by the mildest cooling laxatives. But, should the tumor in the neck suddenly vanish, and the inflammatory fever increase, so as to induce an apprehenson that the brain will be affected, it will be advisable to promote and reproduce the swelling by warm fomentations ; and, to obviate the fatal consequences that may result from its sudden repression, by means of emetics, venesection, or blisters according to the nature of the case.

MUNDIC, or MARCASITE, a species of copper-pyrites found in the tin-mines of Cornwall, and in other parts of the world. It is of various colours, being sometimes yellow, green, or white ; but is easily distinguished by its glittering, and frequently contains a considerable portion of copper.

The steams of this mineral are very offensive to the miners ; they are, however, reputed to be a good vulnerary, and are the only remedy employed by the labourers in tin-mines, who wash their wounds in the water which runs from the mundic-ore.

MURRAIN, a contagious disease incident to cattle ; it is known by the annimals hanging down their heads, which are swollen ; by short and hot breathing ; palpitation of the heart ; staggering ; an abundant secretion of viscid matter in the eyes ; rattling in the throat ; and a shining tongue.

The murrain is occasioned by various causes, but principally by a hot, dry season, or a general corruption of the air. It raged about the middle of the last century in various parts of the continent, and carried off great numbers of cattle. The remedy then employed, both for its prevention and cure, consisted in a mixture of equal parts of gunpowder, salt, soot, and brimstone ; one spoonful of this composition was given for a dose, and washed down with warm water.

In the 36th vol. of *Annals of Agriculture*, the following recipe is inserted for the *murrain in hogs* : A handful of nettles is to be previously boiled in a gallon of small-

beer, when half a pound of flour of sulphur; a quarter of a pound of elecampane, three ounces of liquorice, and a quarter of a pound of aniseeds, are to be added in a pulverized state. This preparation should be administered in milk, and the quantity here stated, is said to be sufficient for six doses.

But the most effectual preventive of this destructive contagion is, to keep the cattle cool during the summer, and to allow them a sufficiency of water: all carrion should be speedily buried; and as the feeding of those useful animals in wet places, or on rotten grass or hay, frequently causes this malady, their food ought to consist of dry and sweet fodder. See also DISTEMPER.

MUSCLE, or MUSSEL, *Mytilus* L. in ichthyology, a genus of shell-fish, consisting of several species; the following of which are the principal; viz.

1. The *margaritiferus*, or pearl-bearing muscle, having a compressed shell, the inside of which is exquisitely polished, resembling in whiteness and brilliancy the real pearl. After being divested of its external laminæ, by aquafortis, and the lapidaries' mill, the outer part acquires a similar lustre.....This is the true mother-of-pearl shell, which is converted into various toys, such as snuff-boxes, buttons, spoons, &c.

2. The *edilis*, or eatable muscle, which has a strong shell slightly covered on one side, and angulated on the other. It is found in immense beds, both in deep water, and above the low-water mark, in the British seas.

The muscle is not only persecuted by numerous enemies, in its own element, but also subject to certain diseases, which have been conjectured to be the cause of the ill effects consequent on the eating of these shell-fish. There are two disorders of that tendency, which, by Dr. MOEHRING, are termed the *moss* and the *scab*. The former is occasioned by the roots of moss being introduced into the shell, so that the water penetrates, and gradually dissolves the fish. The *scab* is caused by tubercles, that are produced by the dissolution of the shell.

Whatever may be the cause, it is well ascertained, that the eating of muscles has sometimes produced cutaneous eruptions; restlessness and agitation; an insupportable itching throughout the whole body, together with erysipelatous inflammations. These complaints, however, may be easily removed by the liberal use of oil, emetics, and of milk; as they have in no instance proved *mortal*.

The edible muscle, nevertheless, furnishes a rich food, though it be difficult of digestion. Even in a sound and fresh state, it is to some constitutions hurtful; and, if contaminated by disease, it becomes, in some degree, poisonous.....As muscles are most detrimental to health, when eaten *raw*, it will always be advisable to boil them with onions; but they should be previously washed with vinegar, and seasoned with pepper: thus qualified, they cannot be injurious, unless eaten to excess, or too frequently.

MUSCLE, in animal economy, a fleshy, fibrous part, destined to be the instrument or organ of motion.

A muscle is composed of a great number of thin parallel plates, each of which is divided into smaller fleshy threads or fibres, and inclosed in its proper cellular mem-

brane....The muscles are divided into three parts, namely, the *head*, *belly*, and *tail:* the first and third are firmly attached to the bones; whereas, the *belly* adheres loosely to other parts, by means of the cellular membrane which swells, when the muscle acts. Their substance is fleshy in the middle, but tendinous or sinewy in the extremities: the fibres of the former are sensible and irritable, while those of the latter are destitute of all sensation.

All the muscles act, by the inflation of their *bellies;* in consequence of which they are compressed or shortened. Thus, in muscular contraction, the moveable bone only is drawn in the direction of the fibres, while the other bone, to which the muscle is attached, remains fixed. Hence, they operate in some measure as a lever; the two ends of every muscle being fastened to the bones by means of the tendons; but, if any fibre or nerve of the muscle be divided, or only obstructed by a ligature, the power of contraction instantly ceases.

Various denominations have been given to the muscles, according to the different parts where they are situated; but, as these particulars belong to the province of anatomy, we shall only mention, that their number in the human body amounts to about 450, while some of the lower animals are provided with several thousand.

Lastly, the colour of the muscles, in healthy individuals, is deep red; but, in dropsical, or those persons whose humours are in a vitiated state, it is of a paler hue. In the aged, the muscles contract and become rigid:.....to retard this inactive and feeble state, there appears to be no better preventive than the frequent resort to the tepid bath; and the constant wearing of flannel next the skin, with a view to promote an uniform degree of insensible perspiration.

MUSHROOM, or *Agaricus*, L. a genus of plants, comprising numerous species, of which more than 300 are natives of Britain; among these, the following deserve to be specified.

1. The *semi-globatus*, or Semi-gobular Mushroom, the gills or under part of which are fixed, and when quite young, of a whitish colour: the edges soon become entirely grey or mottled; and, when old, acquire a chocolate tinge. The stem is hollow, growing 2 or 3 inches high, and about the size of a crow's-quill. This species is found in great abundance on grass-plats, and on pasture, chiefly between the months of July and October; when it ought to be carefully avoided, being one of the poisonous fungi, the inadvertant eating of which has frequently proved fatal.

2. The *muscarius* (Musky), or rather Fly-killing, Reddish Mushroom, has a large head, which is nearly flat, being generally either white, reddish, or of a crimson hue, and covered with raised, compact, angular warts, that are sometimes thin, ragged, and flat. Its stem is solid, but the pith, or internal substance, shrivels as it becomes old, leaving irregular cavities: it grows in pastures from three to five inches in height, and is from three quarters to an inch and a half, in diameter. Among fir-trees, its head is sometimes twelve inches broad, and the stem

from four to six inches high. This species is also pernicious; and, if mixed with milk, is said to destroy flies: the expressed juice from this plant when rubbed on walls and beadsteads, has been employed to expel bugs.....GESENIUS, a medical author of great reputation, observes, that the celebrated *nostrum* sold at Frankfort, in Germany, under the name of *Ragolo's Anti-epileptic powders*, is supposed to consist of the Reddish Mushroom mixed with distilled oil, and pulverized valerian: this remedy is considered, on the Continent, as the only safe and certain specific for the cure of that dreadful malady.

3. The *clypeatus*, or Long-stalked Mushroom, which has a hollow, white, viscid, tender stem, that grows to the height of four inches; and is, in general, not thicker than a crow's-quill. It is found in the month of September, in wood-lands and pastures; is highly deleterious; and, if improvidently eaten, causes great swelling, sickness, looseness, and other fatal symptoms.

These are the principal poisonous species growing in this country: but there are doubtless many others, equally pernicious, though not generally known.....On the other hand, the harmless and esculent mushrooms, are chiefly the following:

4. The *campestris*, Champignon, or Common Mushroom, the stem of which is solid and white, usually 3-4ths of an inch high, and of the thickness of a swallow's-quill. Its gills, when first expanded, are of a bright-red colour, which gradually acquires a darker shade, till they become of a deep-brown cast. This plant at first represents a small globular figure, not unlike a hazle-nut; in which state it is free from worms, and eatable; as the skin, in which it is enveloped, may then be easily separated from its white, juicy flesh: by this circumstance, it will be readily distinguished from a similar plant, the *agarius vernus*, which is said to be poisonous...The common mushroom is found in woods, old pastures, and at the side of roads, where it attains to perfection in the month of September.

5. The *orcades*, *v. pratensis*, or Meadow Mushroom (by some also called *champignon*) is very frequent in heaths, and dry pastures, being generally found in circular clusters. The cap is of a pale brown, nearly flat, and from one to three inches in diameter. Its stem is very tough, solid, and white; grows generally to the height of an inch and a half, and as thick as a crow's-quill. This species is also eatable in September: it possesses but little smell, while raw, and is somewhat dry; yet, when broiled or stewed, it imparts a pleasant flavour.

6. The *cantharellus* (*Merulius cantharellus* of WITHERING), or Chantarelle Mushroom, is wholly of a yellow cast, similar to that of the yolk of an egg. Its stem is solid, tapering downwards, being from one to two inches high, and from 1-4th to 3-4th of an inch in diameter. It is found in woods and dry pastures, from July to September. This plant, when boiled with salt and pepper, possesses the flavour of a roasted cockle; it is esteemed, together with the preceeding species, as a great delicacy.

7. The *deliciosus*, or Orange-coloured Mushroom, grows from one to two inches high: its stem is from 1-4th to 3-4ths of an inch in

diameter, and is crowned with a flat cap, from one-half to three inches broad, and of a rich reddish-brown colour; but its flesh is of a pale orange cast....In its sensible properties, this species is similar to the preceding. It is in season in the month of September, and is found in dry and elevated woods.....The Italians, especially at Genoa, preserve it in olive-oil, and esteem it as great a delicacy as the celebrated *boletus* of the Romans. There are, however, two other varieties greatly resembling the orange-coloured eatable mushroom, but which are in a high degree poisonous; especially the *torminosus (piperatus* of WITHERING), which grows on the roots of birch-trees, for instance, at Haughwood near Woolhope, Herefordshire; and the *necator*, which is of a dirty yellowish cast, appears to be composed of woolly fibres filled with a glutinous dew; and thrives in the same place, as well as in the park at Edgbaston, under large Spanish chesnut-trees.

8. The *cinnamomeus*, or Brown Mushroom, has a convex, but flatted, clothy cap; often with a central rise, in colour resembling that of a chesnut, or newly tanned leather. Its long stem is yellowish and naked, and the gills tawny red. This plant is readily distinguished by its cinnamon colour; in the months of September and October, it abounds in woods: it emits an agreeable odour, and, when boiled, possesses a fine flavour.

9. The *violaceus*, or Violet-coloured Mushroom, has numerous purple gills, eight in a set: the cap being of a purple or brown cast, convex, and the edge turned down; the stem is also purple and cylindrical, from $\frac{1}{4}$ to one inch in diameter, and growing from one to four inches in height. This species remarkably varies, both in its size and tints. When full grown, the cap changes its lilac colour to a russet hue; but the gills continue nearly in the same state; hence, according to Major VALLEY, the latter afford a more accurate criterion, with respect to colour, than any other part of mushrooms in general. The violet-coloured mushroom is in perfection from October to December. When thoroughly boiled and seasoned, it is asserted to be as palatable as an oyster.

We have now enumerated the principal species of mushrooms that are poisonous, as well as those which may be safely eaten; but, as their harmless, or noxious properties, in a great measure depend on the nature and situation of the soil producing them, it will always be necessary to attend to this circumstance, before they are gathered. There is no doubt but that the gills inhale the stagnant or superfluous vapours from the ground; hence, they speedily putrefy, and become the prey of worms, flies, and other insects.

In horticulture, the esculent mushrooms only are raised artificially; for this purpose when no young plants can be procured from the fields or gardens, their roots, spawn, or embryons, may be generated from horse-dung, laid unbroken in small heaps, under cover. In a few weeks, during the summer months, fibrous roots will appear, resembling white threads, which, on separating the heaps, emit the smell of mushrooms.

The dung is directed to be carefully piled up, as entire as possible, about three inches thick, on a hot-bed of a moderate heat; and

formed of alternate strata of horse-dung, and tanners'-waste ; the uppermost layer being composed wholly of tan to the thickness of two inches. The bed is next to be covered with a little manure, and to be raised about three inches, with good soil ; when it is finally overspread with a thick stratum, or coat of straw.

The most proper place for the formation of mushroom-beds, is in the shed usually erected behind hot-houses; because, as these plants vegetate without light, warmth only is requisite, provided they be occasionally watered.....The French practise a method of rearing these plants, which is both simple and expeditious : they pour the water, that has been employed for washing eatable mushrooms, on the usual hot-beds, and thus a constant succession of growth is obtained, especially if the stalks be left in the ground, when their heads or caps are gathered for the table. In China, the putrefied wood of elms and willows is formed into a bed, and covered with the leaves of these trees ; the whole is then frequently watered with a weak solution of nitre. This composition produces continual crops of the most delicious *champignons*, which are collected in the manner before stated.

Mushrooms form an isthmus between the animal and vegetable kingdoms ; and it is not yet ascertained, whether they can be propagated by seed. When in a state of putrefaction, they emit a cadaverous smell ; and it appears from the experiments of Von Humboldt, that they are equally good conductors of Galvanism, or of the *Galvanic Fluid*, as real animal matters. He farther observes, that their participation of animal nature is evinced by chemical analysis ; because mushrooms contain a remarkable portion of azote and phosphorus; and *morels* may be converted into *fat*, by means of the sulphuric acid, or oil of vitriol, diluted with water.

Considered as an article of food, mushrooms are by no means wholesome or nourishing : being tough, and greatly resembling soft leather, they are almost indigestible, and ought not to be eaten by persons of weak or inactive stomachs. Besides, many species of this numerous genus of vegetables are extremely deleterious, and cannot be accurately distinguished from such as are harmless and esculent : it would not, therefore, be attended with any *loss*, excepting to the epicure, if mushrooms were totally banished from our tables. But, if they *must be dressed*, it will be advisable to employ a large portion of vinegar, or other vegetable acid, to counteract their acrimonious and narcotic nature....In order to ascertain, with greater certainty, whether all the plants of a collection which is destined to undergo the culinary process, be of an inoffensive nature, it will be proper to put a peeled onion in the vessel in which they are to be cooked; and, if this root acquire a blueish or dark hue, we may conclude that there are doubtless poisonous mushrooms among them. Should, however, any noxious species have been inadvertently eaten, it will be requisite to take a dose of ipecacuanha, or of the antimonial emetics, in order to eject the poison as speedily as possible ; or, if the accident be discovered only after some hours have elapsed, copious draughts of vinegar and water, or oil and vinegar, will then form the most efficacious antidotes.

MUSIC, denotes the art of producing and combining sounds, in such a manner as to render them agreeable to the ear.

Music forms a pleasing recreation, and is calculated to produce the happiest effects upon the mind, or to exhilarate the animal spirits. Hence it has with the greatest advantage been employed *medicinally;* several instances having occurred, in which patients labouring under delirious fever, were calmed; and, a *critical* sleep succeeding, they were eventually cured.

This art may be likewise beneficially practised by persons of low melancholic temperament; as, according to the nature of the tunes played, it is equally calculated to excite pity, to sooth the mind, and to rouse the social affections. But, as the principles by which these various combinations are regulated, constitute a profound and extensive science, our limits will not permit us to enter into any analysis. The curious reader will derive amusement and instruction from the perusal of Mr. KOLLMAN's *Essay on Musical Harmony* (fol. 1*l.* 1*s.* 1796); the same author's *Essay on Practical Musical Composition* (fol. 1799, 1*l.* 1*s.*), and Mr. SHIELD's *Introduction to Harmony* (4to. ROBINSONS, 1800); in which the subject is scientifically discussed. The History of Music, as well as its present state in France, Italy, Germany, &c. has been ably treated in the voluminous publications of Dr. BURNEY, whose writings on this interesting topic possess classical merit.

MUSK, a drug resembling clotted blood, which is obtained from the musk-bearing animal (*Moschus Moschiferous*, L.) a native of the South-eastern parts of Asia, Siberia, and China: it is secreted in a small bag found beneath the lower belly of this ruminating quadruped.

[MUSQUITOE. A well known and troublesome insect in all warm climates. An experiment lately made in Wilmington, Delaware, would seem to shew, that a small quantity of spirits of turpentine, thrown into a water hogshead, commonly kept in yards, will effectually prevent their propagation. Another portion may be added in a few days afterwards, if necessary..... Water hogsheads are fruitful sources of these insects. From eight to ten thousand of them, it is said, may be seen in a single hogshead. They take wing in about 48 hours after the egg is deposited, and give place to as many more. The period of their breeding is about ten weeks, and allowing a water hogshead to every house in a city, what myriads of these insects must be generated !]

MUSTARD, or *Sinapis*, L. a genus of plants, comprising nineteen species: three of which are natives of Britain: namely,

1. The *arvensis*. See CHARLOCK.

2. The *alba*, or WHITE MUSTARD, which grows in corn-fields, and on road-sides; it flowers in the month of August. This species, when cultivated, thrives best in a soil that is naturally heavy, but which has been reduced to a fine mould, by tillage: it is propagated by sowing one bushel of the seed per acre, in the month of March; it should be frequently hoed; and, when the plants arrive at a proper size for transplantation, they may be set out, ten inches apart. Mustard may be sown on the same land, for three successive years; and it always leaves the soil in sufficient

tilth for the reception of any other crop. Its leaves afford a grateful food to sheep, and other cattle: the seed yields from every cwt. 33 or 36 lb. of a sweet, mild oil..... Bees are remarkably attached to the flowers. This plant is likewise raised by gardeners in the winter, and early in the spring, with a view to supply the table with salad.

3. The *nigra*, or COMMON MUSTARD, growing in corn-fields, on ditch-banks, and road-sides; flowering in the month of June. The sauce called *mustard*, and in daily use at our tables, is prepared from the seeds of this species, obtained by culture, and reduced to powder. They likewise afford a considerable quantity of expressed oil, which partakes but little of the acrimony of the plant. When unbruised, they impart a very weak flavour to boiling water; but, in a pulverized state, they coagulate milk, and strongly impregnate both fluids. If a watery infusion be taken in a considerable quantity, it operates as an emetic; but, in the proportion of a table-spoonful or two, it is a gentle laxative; in this form, it has proved of service in cases of asthma, chronic rheumatism, and palsy. Cataplasms, prepared with crumb of bread, vinegar, and pulverized mustard-seed, are excellent stimulants, when applied to benumbed or paralytic limbs; to parts affected with fixed rheumatic pains, and to the soles of the feet, in fevers that require such treatment. In short, mustard acts powerfully upon the nervous system, without exciting a high degree of heat: by its acrimony and pungency, it stimulates the solids, so that it is deservedly recommended for exciting appetite, assisting digestion, and promoting the fluid secretions, being greatly preferable to the generality of acrid plants of the *antiscorbutic* class.

In 1798, a patent was granted to Mr. ROBERT JOHNSTON, for his contrivance of a medicine, which he calls *Improved Essence of Mustard*. The particulars of this patent are inserted in the 9th vol. of the *Repertory of Arts, &c.*

MUSTARD, the HEDGE, or *Erysimum*, L. a genus of plants, comprising ten species, four of which are natives of Britain.

1. The *Officinale*, COMMON HEDGE-MUSTARD; WORM-SEED; BANK-CRESSES; or SCRAMBLING-ROCKET: it grows under walls and hedges, on road-sides, and among rubbish; where it flowers in the months of May and June. This species possesses a warm and acrid flavour; and, when cultivated, is used as an early pot-herb. Its seeds, taken internally, promote expectoration, the discharge of urine, and other fluid secretions. The juice has been employed with unparalleled success in ulcers of the throat, and for removing hoarseness, occasioned by loud speaking.....Sheep and goats relish this species; but cows, horses, and swine refuse it.

2. The *Barbarea*, WINTER-CRESSES; WINTER-ROCKET: or ROCKET-WORMSEED; which grows on walls, in watery places, on banks of running streams, and is sometimes found in cultivated fields: it flowers from May to October. In Sweden, the common people use the leaves of this herb in early salads in the spring, and late in the autumn: they also boil them as kale....It is sown in Britain to obtain spring-salad, and eaten under the name of *French Cress*.....Cows

devour this plant; but horses and swine refuse it; and it is disliked by goats and sheep.

The *Alliari*, GARLIC HEDGE-MUSTARD, JACK-BY-THE-HEDGE, SAUCE-ALONE, or GARLIC WORMSEED, thriving on ditch-banks, in hedges and shady places; it flowers in the month of May....When growing in farm-yards, poultry are induced to eat this herb, which imparts to their flesh an intolerable rank taste. The Prussians eat the leaves, in the spring, with salted meat; and they are equally useful with lettuce, and the colder salads....In Wales, it is frequently used as a frying herb. The seeds excite sneezing. BAUTSCH employed this herb with advantage in the process of tanning. Cows and goats eat the plant; but horses, sheep, and swine refuse it.

4. The *cheiranthoides*, TREACLE-HEDGE-MUSTARD, or TREACLE-WORMSEED, thrives in corn-fields, and on the banks of rivers; it flowers in the month of July..... The seeds of this species are, according to Dr. WITHERING, successfully used by the country-people, for destroying worms....The plant is eaten by horses, cows, goats, sheep, and swine.

MUTTON, denotes the flesh of sheep, after they have been deprived of life.

The best and most nutritive *mutton*, is that of sheep which are at least three, but not more than six years old; and which have been reared on dry, sweet pastures. The meat afforded by such as have been fed on salt-marshes, or near the sea-coast, is likewise sweet and wholesome; for they have acquired both firmness and a fine flavour, from the saline particles abounding in such situations.

The flesh of ewes, and especially of wethers that have not been kept above the age before stated, is of a rich and invigorating nature; while that of rams is not only tough and coarse, but also has a strong, unpleasant taste. Young meat abounds with sweet juices, and is easy of digestion; though, if under three years of age, it seldom attains its peculiar relish, and is generally somewhat *rofty*.

If a piece of mutton be designed for roasting, it will be advisable to expose it to the open air for several days, according to the state of the weather or season. Thus, it will afford a savoury dish, which is easily digested, and agrees with every healthy person. Mutton-fat, however, is with great difficulty converted into aliment, and ought therefore not to be eaten by invalids, or those whose organs of digestion are relaxed, or impaired by excess; as it coagulates in the stomach, and oppresses its action.

Mutton-suet dissolved in milk, or the *feet of sheep* boiled to the consistence of a jelly, afford excellent clysters, in complaints arising from an acrimony or irritability of the intestines, such as dysentery, &c. the latter preparation, being a very nourishing dish, may also be eaten.

MYRRH, a gummy-resinous, concrete juice, obtained from a shrub growing in the East-Indies, but of which we possess no certain account.

The best myrrh is somewhat transparent, of an uniform brownish, or reddish-yellow colour; of a slightly pungent, bitter taste; with a strongly aromatic, not disagreeable odour, though nauseous to the palate.

In its medicinal effects, this aromatic bitter, when taken by the mouth, is supposed to warm and strengthen the stomach and other viscera; it frequently occasions a mild diaphoresis, and, in general, promotes the fluid secretions.... Hence it has been used with advantage, in cases of debility; in diseases arising from suppression of the urine, or from immoderate discharges, in *cachetic* habits, and those persons whose lungs and throat are oppressed by viscid phlegm....It is farther believed to resist putrefaction in all parts of the body; on which account it is highly recommended in malignant, putrid, and pestilential fevers; and in the small-pox. For these purposes, it should be taken in doses of half a dram or upwards; and it may also be usefully combined with nitre, cream of tartar, or some other cooling salt. Being, however, a heating and stimulating medicine; its *proper* choice requires some precaution, and ought to be directed by professional advice.

[MYRICA, *Candle-berry Myrtle;* a genus of plants comprehending the following native species: 1. *M. Cerifera*. This grows upon low boggy lands in the southern states, rising with many strong shrubby stalks to the height of six or eight feet; the leaves are stiff and spear-shaped, of a yellowish lucid green on their upper surface, but paler underneath; of a grateful odour when bruised. The catkins come out on different plants from the berries, and are about an inch long, and erect. The female flowers come out on the sides of the branches in long bunches, and are succeeded by small roundish berries, covered with a mealy substance, and afford a green wax by boiling.

2. *M. Cerifera humilis*, dwarf candle-berry myrtle, a variety of the former: bark grey, leaves shorter and broader, and more serrated.

3. *M. Gale*, bog gale; also grows in swamps, to the height of two or three feet; leaves lance-shaped, smooth, and a little sawed towards the points. The berries are dry, compressed at the apex, and three lobed. This species grows in New Jersey, but abounds in the eastern states, and in Nova Scotia, according to Mr. BARTRAM.

The wax is obtained in South Carolina and Georgia, by boiling the berries of the *M. cerifera* in water, and skimming it. Mixed with tallow, it forms excellent candles; a soap may be also made from it. The following receipt for the purpose, by Judge BEE, is inserted in a little pamphlet, published in the year 1788, by the *Agri. Soc. of Charleston, S. Carolina:* "To three bushels and a half of common wood ashes, was added half a bushel of unslacked lime; these, being well mixed, were put into a sixty gallon cask, which was filled with water. In 48 hours, the ley was strong enough to bear an egg: it was then drawn off, and from six to eight gallons of it put into a copper kettle, capable of containing about twenty-five gallons; four pounds of myrtle wax were added, and the kettle kept boiling over a constant steady fire, from nine o'clock in the morning, till three in the afternoon. For the first three or four hours, a supply of strong ley was added, from time to time, until the liquor appeared

like soft soap; then weaker ley was poured in occasionally, and the whole frequently well stirred. After six hours boiling, two quarts of common coarse salt were thrown into the kettle, which was left one hour more to simmer over a slow fire. The liquor was then put into two large tubs to cool, where it continued twenty-four hours; and then the soap was taken out, wiped clean, and put to dry. The next day it was weighed, and the produce was 49 lbs. 2 oz. of solid soap." The loss of weight by drying is not mentioned: but Mr. BEE "was informed by one who made the trial, that at the end of six weeks, it was very trifling."

From Dr. BOSTOCK's experiments on myrtle wax, (NICHOLSON's *Journal*, 4th vol.) it appears, that "when boiled with liquid caustic pot-ash, the fluid becomes turbid: but, after some time, the greatest part of the wax rises to the surface, nearly without colour, in a floculent form. A small quantity of it only remains dissolved in the pot-ash, and this may be precipitated from it by an acid. That part of the wax which rises to the surface, is converted into a saponaceous matter: it has lost its inflammability and fusibility, and forms an opake solution with water. From this solution, it is precipitated by an acid in the form of white flakes, which, when collected resemble very nearly the wax before its union with the pot-ash."

In the Medical Repository, of New York, it is stated, that Dr. JOSEPH BROWNE, of that city, had discovered a cheap and easy process for bleaching myrtle wax, but it has not yet been published. No doubt however, the colouring matter may be destroyed by the process for bleaching common bees wax, described in vol. 1, p. 244; or by the vapour of alkalis, which, according to CHAPTAL, destroys the green colour of all vegetable matter.]

MYRTLE, or *Myrtus*, L a genus of exotic trees, comprising forty-two species; of which the *communis*, or Common Myrtle-tree, only is cultivated in Britain. There are several varieties, known under the names of Broad-leaved, Roman, Dutch, and Jew's Myrtle; Orange-leaved Spanish Myrtle; the Thyme-leaved, Rosemary-leaved, Box-leaved, and Upright Italian Myrtles, &c.

All these varieties are beautiful ever-greens; which though requiring the shelter of a green-house in the more northern parts of Britain, during the winter, vegetate most luxuriantly in the county of Cornwall, and on the southern coast, in the open air, without being sheltered from the severity of the winter.

The Common Myrtle is easily propagated by cuttings, which may be set in beds of a rich, but light soil, beneath glasses, or in a green-house, where they thrive with uncommon rapidity....In the Island of Minorca, the young tops are employed for tanning; and the berries are eaten by the inhabitants.

In Britain, however, this species is cultivated chiefly for ornament; though it is likewise of service as a medicine. A distilled water is obtained from its leaves; which, being both detersive and astringent, is sometimes used in gargles, or as a cosmetic for fixing the teeth, when loosened by the scurvy. Its

berries are distilled ; and the oil they yield, is reputed to be excellent for thickening the hair ; on which account it is frequently used as an ingredient in pomatums, and other cosmetics. Lastly, a decoction of the flowers and leaves is said to be of great service in fomentations.

MYRTLE the DUTCH. See GALE the Sweet.

N.

NAI

NAILS, in anatomy, are horny lamina or plates growing over the ends of the fingers and toes of men, as likewise over the lower extremities of the inferior animals.

The use of the nails in animal economy, is to defend and cover the nervous warts or papillae of the toes and fingers from external injury, when they come in contact with rugged bodies. They should not be suffered to grow to a considerable length, as the impurities collecting beneath them not only present a slovenly picture, but such neglect also renders the nails liable to be split and broken by various accidents.

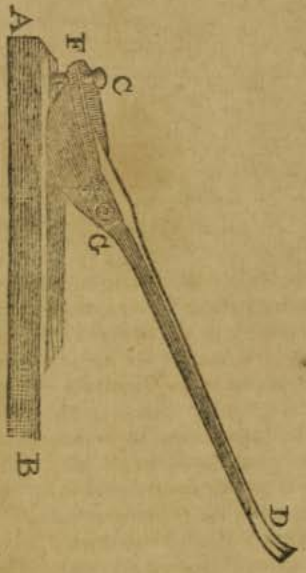
NAILS, in building, are small pointed spikes, generally with a flat, or convex head, made of brass, iron, or other metal ; which, when driven into wood, serves to connect several pieces, such as boards and laths, or to fasten a piece of timber, &c.

NAI

Nails are divided into numerous classes : their figure and size vary according to the purpose for which they are designed ; and which it would be superfluous to enumerate. As they are of such essential importance in building, the arts, and economy in general, several privileges have been granted for new inventions, or improvements, in the manner of casting, or manufacturing them. On account of their ingenuity, the following patents deserve to be mentioned ; namely, Mr. FINCH's, obtained in 1790 ; Mr. CLIFFORD's, registered in the same year ; and Mr. SPENCER's, granted in 1801. But, as these processes can only be understood and practised by manufacturers, we cannot enter into any detail, but refer the curious reader to the 7th, 9th, and 15th vols. of the *Repertory of Arts*, &c. where full specifications are inserted ; and Mr. SPENCER's patent is illustrated with an engraving.

NAIL, and BOLT-DRAWER.

In the year 1787, the *Society for the Encouragement of Arts*, &c. conferred a bounty of three guineas on Mr. William Rich, of Yalding, Kent, for his invention of a machine, which is represented in the following cut, in the action of drawing out a spike.



A. B. the piece of timber, in which the nail or spike C, intended to be drawn, is inserted.

D, E, the shape of the tool, consisting of a lever D, that moves on a solid basis, in the form of a segment of a circle, as at E.

F, a square staple, turning on a centre at G: and, if the spike to be drawn, be held between the lever and the staple, any pressure at D, will act with an effect proportionate to the distance *a* F, and D *a*; and the workman will thus be enabled to exert a very great force against the spike C.

Mr. Rich's nail drawer is both simple and ingenious; it is eminently serviceable in breaking up ships, and on other occasions, where large nails and spikes have been driven deeply into wood, from which they are to be extracted

Nail-wort. See Whitlow-grass the Common.

Naphtha. See Bitumens.

NARCOTICS, a term comprehending opiates, anodynes, or paregorics, and all other drugs which induce sleep or occasion stupefaction.

The narcotics chiefly employed in medicine are, opium, henbane, hemlock, &c. respecting which the reader will, in the order of the alphabet, find a consise account of the cases in which they may be used with advantage.

Whatever tends to induce stupor ought to be carefully avoided, or at least very cautiously administered in disorders of the stomach and intestines; for no other class of drugs is productive of such pernicious consequences to the nervous system. If taken in very small doses, narcotics at first excite and increase the action of the nerves, while they produce gentle undulations of the circulating blood; but, in a larger proportion, they stimulate, and at length reduce or debilitate, all the nervous and muscular functions. Thus, their consequent effect is similar to that of *wine*, which, if used in moderation, promotes a temporary activity, by invigorating the nervous power, or rather by causing an additional motion (which in physic is called *congestion*) of the fluids towards the head; but,

when drank too freely, it weakens and stupifies all the sensitive organs, by the usual pressure it causes on the brain. Hence it will be readily inferred, that such *heroic* remedies can be prescribed with safety, by those only who are acquainted with the animal economy.

NAUSEA, or SICKNESS, denotes a propensity and exertion to vomit, which may be induced by various causes, such as apoplexy, fevers, violent pain, crude aliment, indigestion, diseases of the liver, &c. but especially by any local irritation of the digestive organs.

This affection, though disagreeable, is often very serviceable, by relieving the stomach when overloaded with incongruous matter, and by promoting expectoration in cases where the lungs are oppressed with mucus or phlegm. Farther, it often induces sensible perspiration, and contributes to the proper distribution of the fluids throughout the body: hence, nausea has proved to be an excellent remedy in various complaints, where it was artificially excited, by the smallest doses of emetics. In some cases, however, it is injurious to the patient, especially when too violent, or too frequently repeated; as it is apt to debilitate the stomach; so that, in consequence of the necessary exertions, the patient becomes exhausted, and is apt to be afflicted with ruptures or other maladies.

Pregnant women are particularly subject to nausea, and vomiting, which, if they be not timely mitigated, are productive of the most serious consequences. With a view to afford some relief in those distressing situations, Dr. MARCARD recommends the use of *acidulated mineral waters*, especially those of Sedlitz. The water of pure ammonia, or caustic vegetable alkali, has lately been prescribed with success by Dr. JOHN SIMS, who has often found it eminently useful in cases where acidity prevails, such as heart-burn, cough upon taking food, and other complaints of pregnancy. This judicious practitioner directed twenty drops of the pure ammonia to be taken in a glass of water, from which the patient experienced immediate relief.

NEALING. See ANNEALING.

NECK, in animal economy, that part of the body which is placed between the head and the thorax, or chest.

As the description of the different veins, vertebræ, &c. that compose this part of the human frame, is the province of anatomy, we shall here give a few hints relative to those diseases or injuries, to which the neck is peculiarly liable.

1. The *wry neck*.....This deformity arises from various causes; being sometimes born with persons, though more generally induced by a preternatural contraction of one side of the neck; a relaxation of one part, while the other retains its usual power, &c.

If the distortion be natural, there is little probability of obtaining relief by art; but, if it arise from contraction of the skin, occasioned by burns, the repeated use of oils, ointments, and emollient fomentations, will relax the rigidity of the fibres. In some instances it will be advisable to restore the natural posture of the head by means of a steel collar or other contrivance in which the neck may be supported, till it resume its proper position. Should these exertions, however,

fail to prove useful, surgical assistance must not be neglected; as delay may be attended with danger.

2. *Tumors.* See WENS.

3. *Luxations* of the neck are in general fatal; though, if a partial dislocation take place, it may by proper attention be restored to its natural position. As, however, the treatment in this case is wholly chirurgical, we shall not enter into detail.....Let it be observed that, till proper assistance can be procured, the patient ought to keep himself as quietly as possible; to avoid speaking, and not to indulge in any passions; for the consequences of either may prove fatal.

NECTARINE, a variety of the common peach-tree, from which it differs only in having a smoother rind, and firmer pulp.

There are several varieties of this fruit, known under the different names of Scarlet, Newington, Roman Nectarines, &c.; but, as their properties and culture are similar to those of the PEACH, we propose to give a concise account of them under that article.

NEEDLE, the COMMON SHEPHERD'S, VENUS-COMB, CRAKE-NEEDLE, or NEEDLE-CHERVIL, *Scandix Pecten*, L. an indigenous plant growing in corn-fields, and flowering in the months of June and July....This weed frequently infests corn-fields, and may be eaten as greens, being a wholesome vegetable.....When bruised with marsh-mallows, these two herbs are said to afford an excellent application to fresh wounds, especially with a view to promote the extraction of splinters.

NEGUS, a well-known compound beverage, prepared of one part of Port-wine, and two parts of water, to which is usually added a small quantity of sugar, lemon-peel, &c.

This liquor is salubrious and harmless, especially if the juice of a Seville-orange be substituted for that of lemons.....As the peel of the last mentioned fruit, however, contains a considerable quantity of highly inflammable and volatile oil, negus becomes more stimulating than pure wine, if it be used in large quantities; but if moderately taken, it may contribute to strengthen the stomach. It should, however, be remembered that asthmatic patients, or those who are subject to diseases of the breast, ought carefully to abstain from this and similar drink; an indulgence in which, may be productive of the worst consequences; as the heating oil, together with the fumes of wine, is too powerful a stimulus to their organs of breathing.

NERVE, in anatomy, denotes certain white, round, delicate, substances, similar to cords, which proceed from the brain or spinal marrow, and are divided into numerous smaller fibers or branches, that are dispersed throughout the body.

The nerves have been supposed to contain a very subtle fluid, which may be either of a magnetic or electrical nature; and though the nervous fibrils, when examined with the microscope, appear to be solid bodies, yet they probably conduct a very subtle fluid by means of their interstices. Thus, they are the immediate instruments of sensation, and are indispensably necessary for the continuance of muscular motion.

Wounds are the chief accidents to which the nerves are liable; but

as the former require immediate chirurgical assistance, we shall only remark, that the nerves of several animals are larger than those of man; though possessing a very inferior degree of sensation. Indeed, the mental capacities of beings are by no means proportioned to the size of their nerves, proceeding from the brain: amphibious animals, for instance, possess strong nerves, in proportion to the diminutive size of their brain; and are nevertheless uncommonly dull of apprehension, and even insensible. On the contrary, children affected with the rickets, and persons of lean habits, have a large brain, and very delicate nerves; yet they possess not only a high degree of mental vigour, but likewise uncommon acuteness in the perceptions of sense.

Nervous diseases are supposed to arise from an increased sensibility of the nerves, under the influence of some stimulus; and are principally distinguished by their predominant *painful* symptoms; for instance, violent head-ach, tooth-ach, face-ach, &c. Hence the absurdity of classing almost every complaint, the origin of which is not obvious, among the *nervous*, and to misapply this term to disorders of a very different nature, such as general weakness, occasioned by muscular relaxation, or mental imbecility, peevishness, want of resolution, &c. if connected with bodily causes, however distant or concealed.

NETTLE, or *Urtica*, L. a genus of plants, comprising 57 species, three of which are natives of Britain; namely.

1. The *urens*, or Lesser Stinging Nettle, which is frequent on rubbish and cultivated lands; it flowers from July to September.... The leaves of this species, according to Linnæus, are gathered and cut to pieces, in order to be mixed with the food of young turkies.... the whole plant is refused by every kind of cattle, and ought therefore to be carefully extirpated from pastures.

2. The *dioica*, or Common Nettle, grows on ditch-banks, and among rubbish; it flowers in the month of July. This species has a square, firm stem, three or four feet high, with long-pointed, serrated leaves, that are furnished with stings, having at their base small vesicles full of a corrosive liquor; and which, on being touched, excite a blister, accompanied with a burning and painful sensation.

The Common Nettle, though generally considered as a noxious weed, is of extensive utility: its young tops may be boiled during the spring, and eaten as a substitute for greens; being not only nourishing, but mildly aperient.... In the Western Islands of Scotland, a rennet is prepared, by adding a quart of salt to three pints of a strong decoction of nettles; a tablespoonful of which is said to be sufficient to coagulate a bowl of milk. The leaves are employed for feeding poultry; and especially in the winter, when boiled, they promote the laying of eggs...in a fresh state, they are refused by horses, sheep, goats, cows, and hogs; though asses devour them eagerly. When *dry*, they are eaten by cows, for which they are an excellent food, increasing the quantity, and improving the quality, of their milk. According to M. Van Geuns,

such fodder is an effectual preservative against the contagious distemper affecting horned cattle.

The roots of the Common Nettle, when boiled, communicate a yellow tinge to yarn. But the most valuable part, is its fibrous stalk or stem; which, on being dressed in a manner similar to flax or hemp, has, in some parts of Europe, been advantageously manufactured into cloth. This useful branch of industry has also been attempted in Britain, and a coarse kind of durable canvas was produced, which is considerably harder than the cloth manufactured from hemp or flax. As, however, this plant requires a rich soil to obtain it in any quantities, and, as a much greater degree of attention and accuracy is necessary in the operation of *rating*, than is requisite either for flax or hemp, Dr. ANDERSON is of opinion, that the cultivation of the nettle will be attended with difficulty. From the rind, as well as the woody substance of the stalk, Dr. SCHAEFFER has produced a very good white writing paper; though that manufactured by M. DE VILLETTE, in France, was of a dark green colour. The seeds, on expression, afford an useful lamp-oil.

In a medical view, the whole plant, and particularly the root, is esteemed to be *diuretic*; and has, therefore, been recommended in the jaundice and in nephritic complaints. A leaf, if placed on the tongue, and pressed against the roof of the mouth, is said to be efficacious in bleeding at the nose; and instances have occurred, in which paralytic limbs have been recovered by stinging them with nettles. If credit be due to some authors, the expressed juice of this plant is a valuable remedy to the asthmatic and consumptive.

[Some interesting experiments have lately been made by M. ZANNETINI, in Italy; from which it appears that the flowers and seeds of the Common Nettle may, with efficacy be substituted for the Peruvian bark, in all febrile affections, especially in tertian and quartan agues. This native vegetable operates more speedily than the foreign bark; and, in large doses, induces a lethargic sleep: the portion to be given ought never to exceed one dram, and should be administered in wine, two or three times in the course of 24 hours.... The same cautions that are necessary in the use of the Peruvian bark, are likewise to be observed in taking the seeds and flowers of the nettle. Lastly, M. ZANNETINI recommends a slight infusion of the latter, in wine, as an excellent preservative for those who reside in marshy and unwholesome situations.

3. The *pilulifera*, or ROMAN NETTLE, growing among rubbish, and on old walls. It is found chiefly in the vicinity of Yarmouth, and on the eastern coast of England; it flowers in the month of August.]

Both the last mentioned species possess similar properties; and, as the Common Nettle, in particular, acquires the height of six feet, when sown in September or October, on an indifferent soil, FUNKE strongly recommends its culture; nay, he maintains, that after the second year of its growth, it thrives rapidly, reproduces itself annually, and may be mown two or three times every year. In this respect, it promises to become an excellent fodder for cattle.

NETTLE-HEMP, or *Galeopsis*,

L. a genus of native plants, consisting of four species, the principal of which is the *Tetrahit*, Common Hemp-nettle, or Nettle-hemp All-heal. It grows in hedges, cornfields, and among rubbish; flowers in the months of July and August. In Thuringia, the small seeds of this plant are collected by the poor, and not only sold in considerable quantities as food for birds, but their sweet-oil likewise is expressed; as it affords an excellent supply for chamber lamps. Hence BECHSTEIN advises the cultivation of this vegteable, chiefly on account of its mild salad-oil, which the seeds yield in a large proportion.

NETTLE-RASH, or *Urticaria*, a cutaneous disease, thus denominated, from the resemblance of the eruption to that produced by the stinging of nettles. Numerous pimples appear on the skin, often suddenly after rubbing or scratching it; though they generally vanish in a few hours, and sometimes in a few minutes.

The nettle-rash affects some persons only for one or two hours; others for a few days; while in some it continues for several months, and even years. It more commonly attacks females than males, and children oftener than adults; but is not infectious.

The cause of the nettle-rash is ascribed, by Dr. HEBERDEN, to some mechanical object, applied to the skin, such as COWHAGE, or the spiculæ of cantharides adhering after the removal of blisters; though the disorder may be induced by eating muscles, lobsters, shrimps, and even honey, as likewise from partaking of fish not sufficiently dressed, or of fresh pork, &c. so that the foundation of it appears to be laid in the organs of digestion, which prepare a coarse chyle, consequently crude and acrid fluids. From whatever cause this affection may arise, Dr. H. conceives that it does not corrupt the humours, so as to require *internal* remedies: he is of opinion that, if the itching could be speedily mitigated, no farther medicine would be necessary. For this purpose, a mixture of oil, vinegar, and spirit of wine, may be applied to the skin, and will afford a temporary relief; though Prof. STARCK, of Jena, believes this eruption (when it is of a *periodical* or *chronic* nature) to originate from a diseased viscus or intestine; and therefore prescribes, first, sudorifics and diuretics, then resolvent and strengthening medicines; but especially the copious use of Seltzer water.

NEWSPAPERS, are certain publications, which appear daily, weekly, or at other stated periods of the week, in order to communicate the most important political, domestic, or literary information.

The first English newspapers were published in the year 1642, since which time they have been greatly increased, so that now several millions of copies are circulated every year. Independently of their utility as vehicles of general intelligence, these prints certainly contribute to disseminate useful knowledge of a very diversified nature: and, so long as they are conducted with the strictest adherence to truth and decorum, they may be justly considered as a *national benefit*.

In the United Kingdom, there are not less than 153 distinct newspapers, of which 72 are published in the different counties of

England, 39 in the Metropolis, 15 in Scotland, and 27 in Ireland.

NICKEL, a semi-metal, the use of which has hitherto been very limited. It is rarely found, and almost exclusively in cobalt-mines. The regulus of nickel is in the ore mineralized with sulphur, and mixed with iron, cobalt, and arsenic: when dissolved in acids, it affords green crystals; by means of the fixed vegetable alkali, it produces yellow; and by the volatile alkali, blue solutions.

This semi-metal can with great difficulty be fused with other metals. We understand, however, from a foreign writer, that the Chinese, by the addition of nickel, prepare their *white copper*, which is an elegant composition, and may be applied in the arts, to many useful purposes.

NICKING. See HORSE.

NIGHTINGALE, or *Motacilla lucinia*, L. a small bird, remarkable for the melody of its notes: the feathers of the head, neck, and back, are sallow; the wings and tail brighter than the rest of its body; and the whole creature weighs scarcely one ounce.

Nightingales are birds of passage, probably from Asia, visiting Britain in the beginning of April and returning to the warmer climates in August;.....they never unite in flocks, and their habitations are generally at a distance from each other. The female constructs her nest in low bushes or quickset hedges, well covered with foliage, in the vicinity of brooks; it is externally composed of dry leaves, mixed with grass and fibres, and lined with hair or down: here she deposits four or five olive-green eggs. During the period of incubation, the females alone sit on the eggs, while the males in the vicinity, in a manner emulate with their melodious songs; but they cease to exert their powerful voice as soon as the young are hatched, when they assist in feeding their nestlings.

There are two varieties of this bird, namely, those with a larger and longer body, which sing only at night; and others which are smaller, of a colour inclining to a red shade, and warble more frequently during day-light. Sometimes also, they are of a whitish cast, but rarely met with in our climate.

The proper food for nightingales is, spiders, wood-lice, ant-eggs, flies, and worms; as their diet, in general agrees with them better, when mixed with animal food. These birds are subject to various diseases, which according to some ornithologists, may be averted by giving them, in the month of March, one black spider every day, for six days in succession.

NIGHT-MARE, or *Incubus*, a singular affection, occasioned by a spasmodic state either of the lungs or the abdomen; by a redundancy of blood, or a partial stagnation, in its passages through the heart and the pulmonary vessels.

During this affection, the patient perceives, or imagines that he feels, an uncommon oppression in the region of the breast and stomach, which no effort can remove..... Sometimes he groans, and screams, but more frequently in vain endeavours to speak. At other times, he fancies himself struggling with an enemy, or with demons; to be in a house that is in flames; or in danger of being drowned, &c. so that the terror induced by the frightful ideas which accompany

these uneasy sensations, causes a tingling in the ears, and produces a general tremor.

The night-mare chiefly attacks nervous, hypochondriac, or delicate persons, when lying on their back: beside the causes above stated, it may, in many instances, be assigned to *indigestion*. Hence persons of sedentary habits and weak nerves, especially those who are subject to flatulency, ought carefully to avoid all coarse and heavy nutriment; to eat light but nourishing food; to abstain from late or solid suppers; and lastly, to raise their heads in bed tolerably high. As those who are attacked with the night-mare generally groan when labouring under a fit, it will be requisite to address or *wake* them instantly, as the uneasiness will thus be greatly removed. Should, however, the paroxysm continue to increase, it will be useful to administer small, but frequent doses of valerian, asafœtida, or other antispasmodics, and to strengthen the body with the mildest chalybeates. But if young persons of plethoric habits be subject to this affection, it will be advisable to use a spare diet, to take daily exercise in the open air, and to attend to the state of the bowels, in order to prevent costiveness.

NIGHTSHADE, or *Solanum*, L. a genus of plants, comprising 66 species; of which only two are natives of Britain; namely,

1. The *Dulcamara*, BITTER-SWEET, or WOODY-NIGHTSHADE, growing in all moist brakes, hedges, and on the sides of cold brooks and ditches, where it flowers in the months of June and July. It endures ten years in the same soil, and attains in the shade, the height of seven feet; but, if there be no shrubs in their vicinity, the shoots creep along the ground, and frequently strike *new roots*. On account of their depth, the plant is uncommonly useful towards consolidating dams and banks of rivers. BOERHAAVE informs us, that the bitter-sweet is far superior to sarsaparilla; and, according to LINNÆUS, an infusion of the young twigs is eminently serviceable in acute rheumatisms, inflammations, fevers, &c. It has also been found very efficacious in cases of asthma, jaundice, and of the scurvy; for which purposes, Dr. HALLENBERG directs a pint of boiling water to be poured upon two drams of the stalks, previously sliced and dried: after standing half an hour, the whole must be boiled for about fifteen minutes. The dose is two tea-cupfuls, or more, in the morning and evening. The stalks may be gathered early in the spring, or late in autumn; in smell, the root of this vegetable resembles that of the potatoe. Its beautiful red berries have a disagreeable taste; and possess deleterious properties..... Sheep and goats eat the dulcamara, but horses, cows, and swine, refuse it.

2. The *nigrum*, COMMON NIGHTSHADE, or GARDEN NIGHTSHADE; which grows among rubbish, on dung-hills, and in kitchen gardens: it flowers from June to October. Though generally considered as a poisonous weed, the Dalmatians fry it in butter, and eat this dish with a view to procure a comfortable sleep; an effect which the writer of these pages had occasion to witness. From one to three grains of the leaves, infused in boiling water, and taken at bed-time, induce a copious perspiration, increase the secretion of urine, and

generally operate as a laxative on the following day. Hence this simple preparation, if judiciously administered, may prove of great service in several affections; but its influence on the nerves is too precarious to admit of its use, without professional advice. The leaves, externally applied, abate inflammation and assuage pain; the flowers possess the odour of musk. The whole plant is refused by every kind of cattle.

NIGHTSHADE, the DEADLY, DWAY-BERRIES, or DEADLY DWALE; the *Atropa Belladonna*, L. an indigenous plant, growing in hedges, among lime-stone and rubbish; it flowers in the month of June or July. The whole of this plant is poisonous; and children, allured by the beautiful appearance of its berries, have too often experienced their fatal effects. The most proper antidotes, in such accidents, are strong emetics, large draughts of oil and vinegar, purgatives, blisters applied to the neck; and, after the poison has been ejected from the stomach, the tincture of castor, in small doses of ten or 15 drops, should be diluted in a spoonful of water, and taken every two or three hours. It is asserted, that tumours of the breasts, even of the cancerous kind, have been resolved by a local application of the fresh leaves. A poultice prepared of the roots, boiled in milk, and applied to hard ill conditioned ulcers, has sometimes effected a cure. Although the internal use of this medicine, and its great efficacy in the most obstinate diseases, such as hydrophobia, epilepsy, melancholy, madness, and the distemper of cattle, is attested by many eminent continental writers, yet we do not advise our readers to venture upon a remedy so powerful and dangerous in its effects. The juice of the berries, when ripe, imparts to paper a beautiful and durable purple. Sheep, rabbits, and hogs, eat the leaves of the Deadly Nightshade without the least injury; nay, experience has evinced, that the last mentioned animals have, by the use of this herb alone, been effectually cured of the inflammatory distemper, to which they are subject in dry seasons.

NIPPLE, a small prominence arising from the middle of the female breast. The lacteal tubes terminate in these projections, through which the milk is drawn in the act of sucking.

The nipples of females, when suckling their first child, are frequently so diminutive and deep within the breast, as to render it difficult or impracticable for the infant to extract the milk. In such cases, the young mother should frequently, though cautiously, protrude the nipple between her fingers, by depressing the projecting part of the breast; and afterwards covering the protuberances with an excavated nutmeg, to be worn several weeks previously to her delivery. But if this expedient prove insufficient, it will be advisable to draw the breasts, either by presenting them to a *healthy infant*, several months old; or, by applying Mr. SAVIGNY's small air-pump contrived for that purpose; and which is far preferable to the common breast-glasses, as well as to the disgusting practice of employing quadrupeds.

Another inconvenience incident to nipples, frequently arises from chaps or excoriations. These are not only painful to the mother, but

also prevent the infant from drawing the necessary supply of milk. In some instances, even part of the substance of the nipple is destroyed by violent suction; so that the mother, from the intense pain thus occasioned, is obliged to refuse the breast; and a stagnation of the milk takes place, which is often accompanied with ulcerations and fever. To prevent such dangerous affections, the practice of raising the nipples, as before suggested should be timely adopted; but, if the parts be already in a diseased state, it will then be useful to bathe them with lime-water, or diluted port-wine; after which the nipple should be dressed with a little spermaceti-ointment. Before, however, such applications are resorted to, it will be preferable to anoint the sore part with a composition of white wax and olive-oil, and to cover it with a fine linen rag; by which simple means great relief may often be obtained.

These remedies will, in general, be found sufficient; but, if the nipple receive no benefit, it has been recommended to apply the neck, together with part of the body, of a hog's bladder (or cow's teat taken from a healthy animal,) to the part affected. Either of these, if properly moistened and fixed to the breast, will effectually protect it, while the infant is sucking; and when not in use, the bladder or teat may be preserved in a little spirit of wine, which will prevent it from putrefying. See also THRUSH.

NIPPLE-WORT, or *Lapsana*, L. a genus of plants, comprising five species; one of which is indigenous, namely, the *communis*, Common Nipple-wort, or Dock Cresses. It grows in hedges, shady places, and on rubbish; where it flowers in the months of June and July. The young and tender leaves of this vegetable have the flavour of radishes, and may be eaten raw, as salad. Though possessing a bitter taste, they are a wholesome vegetable; and, in some parts of England, the country people boil them as a substitute for greens.

NITRE, or SALT-PETRE, is a species of salt, which, in Persia and the East Indies, is extracted from certain native earths. It is likewise artificially produced in several parts of Germany, Hungary, and especially in France; either from the rubbish of old clay-walls and ceilings, or from animal and vegetable matters suffered to undergo putrefaction, which is promoted by the addition of ashes and of lime; when the whole is exposed for a considerable time to the access of the air, in a direction from north to south.

Nitre is of a sharp, bitterish, penetrating taste, followed by a sensation of coldness. When pure, it dissolves in about six times its weight of water, and, on evaporating the latter, concretes into transparent crystals. It easily melts in the fire; where it deflagrates with a bright flame, accompanied with a crackling noise, and afterwards deposits a large portion of alkaline earth.

Salt-petre is of great utility both in the arts and in medicine. Its spirit, known under the name of AQUA-FORTIS, is extensively employed both in dyeing, and in refining, as well as for other purposes, the principal of which we have already stated.

Purified nitre is prescribed with advantage in numerous disorders:

it is usually given in doses of from two or three grains to a scruple; being a very cooling and resolvent medicine, which by relaxing the spasmodic rigidity of the vessels, promotes not only the secretion of urine, but at the same time insensible perspiration, in febrile disorders; while it allays thirst, and abates heat; though in malignant cases, in which the pulse is low, and the patient's strength exhausted, it produces contrary effects.

When combined with the Peruvian bark, nitre affords an useful corrective to that drug in the cure of spreading gangrenes; as it prevents the additional heat which the bark frequently occasions: so that the efficacy of the latter is increased by the antiseptic quality of the former. But this cooling salt should never be administered in cases where the violence of the fever depends on bilious or putrid impurities in the abdomen; and where the patient is subject to hemorrhages or fluxes of blood, arising from a vitiated state of the fluids. On the contrary, salt-petre will be most beneficially used in acute rheumatisms, inflammatory fevers, and even in those hemorrhages arising from congestions of the blood in general, or from a plethoric state.

With respect to the antiseptic properties of nitre, in domestic economy, we refer to the articles Beef; Butter; Pickling; and Pork.

Nits (in Horses). See Staves-acre.

Nonsuch. See Trefoil Medick.

NOSE, in anatomy, the external organ of smelling, or that part which projects from the middle of the human face.

The nose is subject to various affections, such as ulcers, luxations, fractures, &c. the treatment of which is foreign to our purpose: we have already discussed the subject of hemorrhages, under the article Bleeding.

If the nose of an infant be obstructed with any gross matter, so as to impede respiration, or to prevent him from sucking or swallowing, it will be advisable, every evening, to anoint the part with a little sweet-oil, or fresh butter. By this simple application, the gross particles will in most instances be dissolved, and the faculty of breathing speedily restored.....Should, however, the obstructions continue after the repeated use of this remedy, it will be necessary first to administer one or two gentle laxatives; such as a tea-spoonful of castor-oil, or a grain of rhubarb; after which the nose is to be frequently bathed with a linen rag, dipped in a filtered solution of two or three grains of white vitriol, in one ounce of marjoram-water.

NOSTRILS, are two apertures or cavities of the nose, through which the air passes. These apertures are divided from each other by a cartilage: they are lined with a very sensible membrane, and answer the conjoint purposes of smelling, respiration, and speech.

As the delicate membrane which lines the nostrils, is the common integument of the mouth, and other interior vessels, it will be readily conceived, that its exposure to sudden changes of temperature, must be productive of injurious consequences. Hence the necessity of guarding against *cold*, when hastily leaving the fire-side for encountering the frosty air of winter, or returning from the latter to a

heated room. Although the frequent colds and catarrhs are generally considered as trivial, and too often neglected, yet we are persuaded, that by far the greater number of consumptive and asthmatic sufferers date the period of their declining health from such inattention. We therefore recommend to those who are yet susceptible of advice, previously to exposing themselves to a damp, cold, or sharp air, to spend a few minutes in a cool, temperate room, or to apply a handkerchief to the mouth, when suddenly coming in contact with the external air, till they become gradually accustomed to its stimulus. Thus, we doubt not, many complaints of serious consequences, might be easily prevented.

NOSTRUM, denotes any medicine the composition of which is supposed to be secret, and confined to the knowledge of one, or a few individuals.

The natural desire of health and longevity, has in all ages afforded a pretext to designing men, to invent medicines, with the absurd view of curing *every* disorder. It is true, that the confidence in *panaceas*, or universal remedies, is gradually delining, among the higher as well as the lower classes of society; but innumerable elixirs, drops, pills, &c. for particular complaints, are daily imposed upon the public by pretenders, whose chemical and medical knowledge is so confined, that they are generally obliged to borrow the recipes for such preparation from printed books. To aggravate the evil, their pernicious compounds for the most part contain opium, hemlock, or other narcotic drugs, which are rendered still more deleterious by the addition of stimulating gums and aromatic substances.

The duration and extent of such base practices, it is difficult to determine; though we conceive that, so long as the thoughtless and dissipated indulge in sensual pleasures of every description, the audacity of pretenders to the healing art will continue to increase. Experience has too often evinced, how little efficacy *medicines* possess in a variety of cases, without a strict adherence to a proper *regimen*; and much less may be expected from any nostrum, however strongly recommended by the dignitaries of church and state. Nay, the excellence and dignity of medical science can neither be supported, nor depreciated, by the illusion of great names. If a due regard were more generally had to the laws of temperance and sobriety; if the cool dictates of reason were more frequently consulted, there would be fewer diseases, and those who enrich themselves at the expense of a credulous public, would speedily be compelled to pursue occupations less fraudulent, and more beneficial to the community.

NOVEL, a fictitious history, written with a view to exhibit the emotions of the human heart; the happiness and misery of private life; the effects of indulging the passions, and especially that of Love.

The origin of modern novel-writing, together with the requisites essential to an interesting work, we leave to the discussion of the critic. There are, indeed, too many publications of this nature; but the generality of such performances, instead of inspiring

the young mind with ne love of virtue, and a detestation of vice, are only calculated to excite the most insidious and sensual ideas: hence we think it our duty to caution parents with respect to the purity of such compositions as may fall into the hands of their unguarded children.

As the design of novels or romances is the interest of the human heart, they are too apt to lead it astray, unless written in a chaste and correct style. Numberless are the victims of delusion, especially in the metropolis, whose wretched state commenced with the indiscriminate perusal of seductive novels. Nor is this evil confined to the middle ranks of society, in cities, or to boarding schools. The farmhouse and the cottage, in many parts of England, furnish subscribers to circulating libraries, at the distance of several miles from the town or village, where the most absurd, and frequently immoral narratives (provided they are handsomely printed), are eagerly read, and dignified with the title of a "Novel."

By these brief strictures, we by no means intend to proscribe the dissemination of knowledge, particularly among the lower classes. ....There undoubtedly are novels (though few in number), which deserve to be perused by inexperienced youth, and which reflect credit on their authors. Such "familiar histories," in the opinion of the late Dr. JOHNSON, "may perhaps be made of greater use than the solemnities of professed morality, and convey the knowledge of vice and virtue with more efficacy than axioms and definitions." But, if the power of example be so great as to take possession of the memory by a kind of violence, and produce effects almost without the intervention of the will, care ought to be taken, that the *choice* is unrestrained, the best examples only should be exhibited; and that what is likely to operate so strongly, should not be mischievous or *uncertain* in its effects.

NOURISHMENT, in animal economy, denotes the reparation of the continual waste which bodies undergo in consequence of exercise, the effects of air, hunger, thirst, sleep, &c.

Nutriment is afforded by proper food containing alimentary juices; and which, after due mastication, is digested in the stomach, converted into chyle, incorporated with the blood, and thus distributed throughout the body for its support. In young persons, the nutritious juices not only contribute to restore the continual waste, but also to increase their size, which is denominated *growth*. In adults, likewise the epidermis, or scarf-skin, though continually peeling off, is always renewed; and, if any muscular parts be separated from the body, they are speedily supplied with new substance: in a similar manner, wounds heal spontaneously; and such persons as are emaciated or exhausted, again grow plump, and even become lusty....See DIGESTION and FOOD.

NURSE, a woman who professes to rear young children, or to attend sick persons.

The duties incumbent on nurses, whether intended for the management of infants, or of patients, are equally important. Hence the utmost precaution is requisite to select such as are *cleanly*, in good health, and uncontaminated by any latent disease, especially if they

be destined to suckle children: for, it is a melancholy truth, that the hopes of many families have sunk into an early grave, after they had intrusted their offspring to nurses, who were tainted with the scurvy, or other fatal disorder. Such vigilance, therefore, ought not to be relaxed, even though proper persons have been procured; because there are many, who, from selfish and superstitious motives, will not hesitate to use the most hurtful means of lulling the child to sleep: thus, the innocent babe is early inured to the taste of *spirits*, which it retains even at a maturer age, and insensibly becomes the most detestable of characters, a *drunkard*. To prevent these and similar abuses, we would seriously advise all parents to visit their children, not merely on Sundays, but as often as their time will permit on other days of the week; as these unexpected calls will enable them easily to ascertain, either the propriety, or mal-practices, in the conduct of those persons to whom they may have committed the care of their children.

With respect to *sick nurses*, we cannot omit to observe, that they ought to be *cleanly* and *warmly* clad. If they are obliged to attend their patients during the night, it would be advisable (especially in dangerous cases, and where the expenses can be afforded) always to employ *two* nurses, so that the one may relieve the other; and the afflicted may receive that prompt attention, which many of those mercenary hirelings unwillingly bestow. Indolence and slight, however, are not the only evils, to which the unresisting patient is often doomed to submit. During the destructive plague, which depopulated London city, in the reign of CHARLES II. the merciless miscreants who had the charge of the infected, not only plundered them while expiring, but even terminated their existence by violence, and had the audacity to attribute their decease to the malignance of the distemper!

The mind shudders with horror at the recollection of such atrocious crimes, and is tempted to hope, for the sake of humanity, that such outcasts of society no longer exist. But, alas! instances have repeatedly and lately occurred, in which the cap has been removed, and a better one substituted; nay, the rings were torn out of the patient's ears, while in the agonies of death. The finest linen has been found on the bed, damp and unaired, being the nurse's perquisite, when her hapless victim is no more; and other cruelties have been committed, the enumeration of which would shock the feelings of the most phlegmatic reader.

Although it is painful to record atrocities which degrade human nature, yet they cannot be too generally known, that all persons may be rendered vigilant in the selection of those who are appointed to attend the sick. It is not, however, our intention to insinuate, that all nurses are thus depraved. There may, doubtless be found persons whose humanity and attention to the diseased, render them worthy of the greatest commendation; but the safety and welfare of society seems to require, that proper measures be taken, to prevent the repetition of such enormities for the future: and we trust, that considerable benefit would result from an institution, the object of which should be the appoint-

ment of proper nurses; so that none be permitted to perform that important office, unless provided with a certificate, signed by three or more medical practitioners.

NURSERY, in horticulture, a piece of land selected for raising or propagating plants and trees, with a view to supply both gardens and plantations.

As we state, under distinct heads, the mode of cultivation to be adopted in the rearing of plants, both when in the nursery, and also after their removal to the spot where they are intended to remain, we shall at present communicate a few general hints and directions.

I. A nursery ought to be situated contiguously to the dwelling-house, that it may be conveniently inspected in every season: it should likewise be in the vicinity of a brook or rivulet, in order that there may be a constant supply of water, during the hot days of summer.

II. If it be intended for timber-trees, MILLER advises the nursery to be formed on the ground which is designed for the future plantation, so that a sufficient number may be suffered to stand, when the others have been removed.

III. The ground appropriated to *flowers*, ought to be exposed to the south, but at the same time sheltered from strong winds, either by means of trees or buildings....The soil should be light and dry, especially for bulbous-rooted plants.

IV. With respect to *fruit-trees*: 1. The soil ought to be fresh, rather dry than moist, and not richer than that into which they are finally to be transplanted. 2. It should be carefully inclosed, to exclude hares, rabbits, and all other animals that infest young plantations; after which the ground must be diligently cleared from all weeds, and *trenched* to the depth of about two feet, in the month of August, so that the nursery may be ready for the reception of the young stocks, in October. 3. On the approach of the planting season, the trenches must be filled up, the soil be laid as level as possible, and divided into equal quarters, which ought likewise to be subdivided into beds, wherein may be sown the seeds or stones of the fruit intended to be reared. Lastly, when a sufficient number of *stocks* is obtained, they must be removed into such soils, and exposed to such situations, as the nature of each fruit may require.

NURSERY, in domestic life, denotes an apartment devoted exclusively to the rearing and accommodation of children.

The room designed for this purpose ought to be lofty, perfectly dry, and in the attic story of the house, or at least above the ground-floor. Another requisite to nurseries is, that they be spacious and airy, so that their young inhabitants may have sufficient room to exercise themselves, when the inclemency of the weather prevents them from partaking of the benefit of the open air. Too many windows, however, afford too strong a light for infantine eyes, and the rays of the sun are, to their weak organs, not less hurtful than close walls, and dark apartments.

Cleanliness ought particularly to be attended to; and every care should be taken to render the air of nurseries perfectly dry and pure. Whatever tends to corrupt the atmosphere, must therefore be studiously avoided. No damp li-

nen, or swaddling clothes, should be washed, or suspended for drying in such apartments; nor should any provisions, especially animal food, be cooked there; for all these processes vitiate the atmosphere, and produce exhalations which are highly injurious to the eyes of infants; frequently occasioning chronic inflammations in those organs. The nursery ought, likewise, to be carefully swept every day, while the children should be removed at least into another room, if the weather prevent them from making excursions abroad.

Lastly, in case the air of the nursery has become corrupted by accident, the windows should be frequently opened, to promote its purification, by the influence of the fresh atmosphere, which is far preferable to fumigations with frankincense, or similar aromatics; for, though such perfumes dissipate the offensive smell for the moment, they introduce a stupefying vapour that is extremely hurtful, especially if the children be descended from weakly parents.

NUTMEG-TREE, or *Myristica moschata*, L. an exotic plant growing in India; resembling in size and growth the common cherry-tree; and bearing fruit throughout the year.

Nutmegs have long been employed both for culinary and medicinal purposes. On distilling them, one pound of this fruit affords, according to GLEDITSCH, only four or five drams of essential oil, which possesses the flavour of the spice itself. An inspissated decoction produces an extract of an unctuous, slightly bitterish taste, which is somewhat astringent. Rectified spirit extracts the whole virtue of nutmegs by infusion. When heated, this spice likewise yields by expression a large portion of a limpid yellow oil, namely, four or five ounces from every pound; and which, on cooling, concretes into a soapy consistence.

In the Island of Banda, the whole fruit of the nutmeg-tree is preserved, by boiling it first in water, and afterwards in syrup; or by pickling it in brine, vinegar, &c. in a manner similar to walnuts.

With respect to their effects on the human body, nutmegs are strongly aromatic, stomachic, and astringent: hence this drug has often been used for diarrhœas and dysenteries, in doses from ten to 20 grains in powder, or in larger quantities, when infused in Port-wine. In violent head-achs, arising from a debilitated stomach, *small doses* of this medicine have frequently been found of real service; but, if injudiciously employed, it is apt to infect the head, not unlike opium and other powerful narcotics.....The officinal preparations of nutmeg are, a spirit, and an essential oil: the nutmeg in substance is also roasted, to render it more astringent...See MACE.

NUTRITION. See NOURISHMENT; and FOOD of Plants, vol. ii.

NUX VOMICA, a flat, compressed, round fruit, about an inch in diameter, of a greyish-brown colour, of a horny consistence; and the surface of which is somewhat wrinkled. It is the produce of a tree growing in the East Indies; possesses a bitter taste, and has been found a certain poison for dogs, cats, fish, &c. Nevertheless, this highly deleterious fruit has lately been employed on the Continent, as a medicine of great efficacy, in spasmodic affec-

tions of the bowels, especially in the contagious dysentery, as well as in obstinate quartan agues, &c. But, as its administration can be directed only by professional men, we forbear to mention the proper doses, and shall only observe, that the London brewers have frequently been suspected of adulterating their ale and porter with this narcotic drug, in order to render them more intoxicating, though such charge has, to our knowledge, never been proved in a court of justice.

NYMPH (in Botany) See CHRYSALIS.

O.

OAK

OAK, or *Quercus*, L. a genus of plants, consisting of 29 species, two of which, according to Dr. WITHERING, are indigenous. The principal of these is the *Robur*, or Common Oak, found in various parts of Britain, where it flowers in the month of April.

The oak thrives better in hilly than in boggy ground, but flourishes most luxuriantly on rich black soils, or in strong moist loams; and, while it is young, in large plantations. It is propagated generally by sowing acorns in the proportion of from four to six bushels per acre, together with some white thorn-berries, and seeds of furze or whins: both to shelter the young plants from the severity of the cold winds, and also to protect them from being devoured by hares, rabbits, &c. As they advance in size, the stronger saplins should be selected to stand, while the more weakly are occasonally cut down; because the roots of the oak strike deeply into the ground, and the tree will not always grow with equal energy, if it be removed from its primitive soil. Nevertheless, very young oaks may be transplanted two, and even three times, provided the tap or principal root be cut off at every removal; though such trees will be neither so *full at heart*, compact, and strong, nor so lasting as those which are suffered to stand on the spot where the seed was originally deposited.

This tree is remarkable for the slowness of its growth, its great bulk, and longevity. It has been observed, that the trunk attains, in general, only fourteen inches in diameter, in the course of eighty years. But, after arriving at a certain age, its *bulk* rapidly increases: thus, the trunk of an

oak, belonging to Lord Powis, and growing in Bromfield wood, near Ludlow, in Shropshire, measured, in 1764, *sixty-eight* feet in girth, and twenty-three feet in length; containing in the whole 1455 feet of timber, round measure, or twenty-nine loads and five feet, each load consisting of fifty feet. And Dr. Darwin mentions the *Swilcar Oak*, a very large tree growing in Needwood forest which measures *thirteen* yards in circumference at its base, *eleven* yards round, at the height of four feet from the earth, and which is believed to be *six hundred* years old.

The oak is one of the most valuable and majestic trees: its leaves are eaten by horses, cows, goats, and sheep; deer and swine fatten on the acorns. Its bark, when stripped off, is usefully employed for tanning leather, and afterwards for hot-beds and fuel. It should not, however, exceed the age of 40 or 50 years, as after that time it becomes *corky*, and does not answer the purpose of the tanner.

Oak-timber is well adapted to almost every purpose of rural and domestic economy, particularly for staves, laths, and spokes of wheels. Being hard, tough, tolerably flexible, and not very liable to *splinter*, it is generally preferred to all other timber for building ships of war; especially if the tree be suffered to stand for three or four years after it has been *barked;* because it thus becomes perfectly dry, and the inspissated sap renders it much stronger than the heart of any other oak-tree, which has not been stripped; so that the timber acquires greater strength, weight, hardness, and durability.

As this tree is of such eminent utility in naval architecture, and cannot be *bent* without great difficulty, Mr Randall, of Maidstone, in Kent, proposed in 1795, to the *Society for the Encouragement of Arts*, &c. a method of training oaks to *compass-shapes*, for the purpose of ship building. His plan consists in reversing the practice usually followed, in order to obtain *strait-stemmed trees;* by taking off, every year, in the months of March and June, all the lateral shoots closely to the stem, commencing when the tree is about eight feet high, and continuing the operation every year, till it has attained the height of 20 feet. In consequence of this management, the oak grows somewhat crooked, and the curvature will increase as the tree advances in years.

This part of his plan Mr. Randall considers to be particularly applicable to parks, hedge-rows, or open plantations. The other part of his suggestion relates to forests, in which the underwood is regularly cut every fifteenth or twentieth year, and where many clean and thriving young oaks are often discovered. If two of these grow so near as to reach each other by inflection, he proposes to bend down their heads, by means of a hooked stick, and to join them together, by interweaving their respective branches; in consequence of which, the trees will assume a direction that will greatly facilitate the future labour of the shipbuilder. The proper time for performing these operations is from the age of eight to fourteen years, if the oaks grow freely; and the best season for interweaving the branches, is in the spring before

the leaf appears. Although we cannot enter into farther details, relative to this method of promoting the growth of compass-timber; yet we trust the plan is sufficiently obvious and practicable, to be generally adopted: the curious reader is therefore referred to the 13th vol. of the Transactions of the patriotic Society abovementioned.

The saw-dust, and even the leaves, though inferior to the bark, has been found useful in tanning. It appears from numerous experiments, made by the Rev. Mr. SWAYNE, of Puckle-church, near Bristol, and recorded in the 10th vol. of the *Transactions of the Society for the Encouragement of Arts, &c.* that half a peck of oak leaves contains nearly as much astringent matter as one pound of bark. Farther, the leaves make excellent hot-beds, and the saw-dust is the principal indigenous vegetable used in this country, for tinging fustians of various brown colours.

The GALLS, or excrescences, produced on the leaves, are employed for dying, and various other purposes, already stated under art. GALL in our 2d vol. The balls, or apples, growing on this tree, are sometimes substituted for the galls, in dying black colours, with the addition of copperas; but these shades, though more beautiful, are by no means of equal durability to those obtained from the former. Lastly, the juice expressed from oak-apples, when mixed with vitriol and gum arabic, will make an excellent black ink.

With respect to the medicinal properties of the oak, its bark is a powerful astringent, whence it has often been used with advantage in hæmorrhages, alvine fluxes, and other immoderate secretions.

Beside the common oak, so generally known and cultivated, there is an exotic species, which has lately been recommended to public attention by Mr. CHARLES WHITE, in the 5th vol. of the *Memoirs of the Literary and Philosophical Society of Manchester*. This species is there called the *Iron*, *Wainscot*, or *Turkey Oak*, and is stated to be a non-descript variety of the *Quercus Cerris*, or smaller prickly cupped Spanish Oak, or that which Mr. AITON (in his *Hortus Kewensis*,) terms the *frondosa*. The Iron Oak grows to a considerable height, producing a bulky trunk, and widely spreading head, with large oblong-oval, deeply-serrated leaves, and acorns of an unusual size, in capacious prickly cups: from these circumstances, we believe it rather to be the species denominated *Ægilops*, or Large Prickly-cupped Spanish Oak; which grows not only in Spain, but also in Turkey (whence the *Iron* kind was originally brought to England), and corresponds in every other respect to the Iron or Wainscot Oak.

This valuable species is propagated in a similar manner with the common British Oak, which it fully equals in hardness and weight, while it excels in growth or size, as will appear from the following comparative statement:

	Height. Feet	In.	*Girth.* Feet	In.
An Iron Oak, 20 years old, measured	36	0	3	3
Another of the same age	37	0	3	0
An English Oak, 20 years old	28	0	2	6
Another 40 years of age	39	0	2	10

Our limits will not permit us to enter into an analysis of Mr. WHITE's Memoir; we shall therefore, only observe that the species now recommended, will thrive much faster than the common Oak in a similar situation; and that, as it carries up the thickness of its *buts* much higher, they contain *five* or *six times* the quantity of wood, found in the English species.... The Wainscot Oak has hitherto been employed only in making posts, pales, &c.; but it appears from Mr. W's observations, that it promises to be equally useful as the British trees, for every purpose of ship-building or of carpentry.

[The natural history of the AMERICAN OAKS, was first partially given by JOHN PHILIP DU ROI, who published his observations in two volumes 8vo. at Brunswick, in Germany, in 1771: and lately, (1801,) and more extensively, by ANDREW MICHAUX, the celebrated botanist, who resided many years at the *Botanical Garden* which was established by the late LOUIS XVI, king of France, near Charleston, South Carolina. The species and varieties described, are twenty-nine. This truly superb work, ought to be in the hands of every gentleman in the United States.... Some copies were sold in Philadelphia last year, at the low price of $10.

The most valuable species of native oaks are:

1. The *Quercus alba*, white oak; the wood of which is firm and close grained, and in daily use for ship-building, fence posts, rafters, and for every other purpose, where strength and durability are required.

2. *Quercus tinctoria*, great black oak, champlain black oak....the *Q. angulosa* and *sinuosa* are varieties of this species.

The wood of this tree is of a coarser grain than that of the white oak, and of a reddish colour: between every year's growth, also, it appears porous, yet when dry and seasoned, it becomes strong and durable. The bark of the *sinuosa* has, for a long time been in great repute in this country for tanning, and for the very excellent *yellow dye* which it affords. Dr. BANCROFT of London, learned the use of the bark as a dye, when in this country, during our revolutionary war; and introduced it in the manufactories of England, to which country, many ship loads of the article ground, have been annually shipped, under the name of *Quercitron bark*. Dr. BANCROFT has treated fully of the chemical history of this bark, in his late excellent work entitled "*The Philosophy of Permanent Colours.*"

3. *Q. rubra*, Spanish oak; the bark of this species is somewhat rough, and light coloured. The leaves are deeply and obtusely sinuated, and end in several acute bristly points: the footstalks are pretty long. The timber is generally worm-eaten, or rotten at heart; but the bark is preferred to all other for tanning, and is much dearer.

4. *Q. virens*, live oak. This species is confined to Georgia, S. Carolina and Florida. The tree is of uncommon magnitude, and singularly beautiful. The moss hangs in lengths of several yards, from the large branches of the old trees, and waving with the wind, gives the tree a venerable appearance. The wood is proverbial for its durability, when cut at a proper sea-

son, and is much used for ship timber. When we come to treat of TIMBER generally, the influence of the season in which the tree is felled, shall be particularly noticed. Mr. BARTRAM says, the acorns of the live oak, when roasted, are nearly as sweet as chesnuts: and that the Simminoles Indians on the Florida coast, draw a great quantity of oil from them, which they use as food and ointment.]

OAT, or *Avena*, L. a genus of plants, comprising 33 species, of which the following are the principal: and the six first mentioned are natives of Britain; namely,

I. The *nuda*, NAKED, OAT, PILCORN, or PILLS, growing wild in some parts of Staffordshire, and flowering in the month of July.... This species is cultivated in the county of Cornwall; where, in the time of RAY, it was sold at the price of wheat. It is reputed to be nearly as good as the common oat; for it yields excellent meal; is equally useful in feeding cattle; and thrives on the poorest lands.

II. The *elatior* (*Holcus avenaceus* of Dr. SMITH), TALL OAT-GRASS, or OAT, thrives on wet, damp soils; in meadows, pastures, and hollow ways; it flowers in the months of June and July. This grass vegetates with uncommon luxuriance; and though somewhat coarse, it makes tolerably good hay. It is eaten by cows, goats, and sheep, but is frequently very troublesome in arable lands; as its roots spread in a manner similar to couch-grass, and are very difficult to be eradicated. [See GRASS.]

III. The *fatua*, BEARDED WILD OATS, HOVER, or HAVER, is found in corn-fields, where it flowers in the month of July or August..... This species is eaten by horses, sheep, and goats; it is a pernicious weed in corn-fields, particularly among barley, where it is sometimes so prevalent, that it almost entirely choaks the growth of the latter. It may be extirpated by repeated fallowing, or by laying the land down to grass.

IV. The *pubescens*, ROUGH OAT, DOWNY OAT-GRASS, or HAIRY OAT-GRASS, which grows on dry meadows, in chalky situations, and flowers in the month of June. It is refused by every species of cattle; and, on account of its roughness, does not deserve to be cultivated.

V. The *flavescens*, YELLOW OAT, or OAT-GRASS, thrives in meadows, pastures, and on hills, in a calcareous soil, and flowers in the months of June and July. This species, though tolerably sweet, is inferior to the meadow and fescue-grasses. Dr. WITHERING observes, that cattle do not relish it, but Mr. SWAYNE states it to be one of the best of this genus, for the use of the farmer.

VI. The *pratensis*, MEADOW OAT, or NARROW-LEAVED OAT-GRASS, is likewise a native of Britain, growing on heaths, and high calcareous lands; flowering in the month of July. This species is a tolerably good pasture grass, and particularly calculated for poor stony soils; as it prospers where the meadow-grasses will not vegetate.

VII. The *sativa*, or COMMON OAT, thrives on almost any soil; and, being extremely productive on land newly broken up, it is eminently adapted to cold mountains, or marshy ground. It is divided into three varieties, namely:

1. The *White Oats*, which are the most valuable, and require a

soil somewhat drier than that for the other species : this variety is chiefly cultivated in the southern counties of Britain.

2. The *Black Oats*, which are principally raised in the northern parts of this island :....for feeding cattle, they are of equal quality to the white oats ; though not affording so sweet a meal for culinary purposes as the latter.

3. The *Brown* or *Red Oat*, produces good meal ; ripens somewhat earlier than either of the two preceding varieties, and does not shed its seed. It is chiefly cultivated in the north-western parts of England, for the feeding of cattle.

All these varieties are propagated by seed, which may be sown from the middle of February to the beginning of June, in the proportion of from three to six bushels per acre, broadcast; though sometimes with the addition of 12lbs. of clover, and one bushel of ray-grass. The seed is harrowed in ; and the management of this kind of grain does not materially differ from that of barley, rye, &c. Oats have, in the south of Britain, been both dibbled and drilled ; but, as this new practice has been attempted only by a few farmers, the success has not been completely ascertained ; tho' there is little doubt but that either method, if judiciously conducted, is preferable to the broadcast system.

The last mentioned species is raised on account of its farinaceous properties. The grain is given to horses, for which it affords a very strengthening food ; and, before barley came into general cultivation, it was converted into malt.

The meal is, in North Britain, made into cakes, biscuits, &c. ; or it is boiled into a kind of pottage. Lastly, its soft straw is usefully employed in feeding cattle, when mixed with potatoes ; and likewise for packing glass and earthen-ware.

Beside the three varieties into which the common oat is divided, there are two others, which have originated from them, namely :

1. The *Peebles-oat*, is a variety of the red-oat, and which was first cultivated in the Scotch county of that name. It is peculiarly calculated for mountainous districts, as it not only ripens early, but also withstands the severity of the wind and is not easily shaken. Its grains, though smaller than those of any other oat, have a very thin hull, and yield an unusual proportion of fine, wholesome meal.

2. The *Angus-oat*, which has in a similar manner been denominated from the county of Angus, in Scotland ; and is a variety of the white-oat, but produces a *better-bodied* grain, together with a greater quantity of straw ; and is thus eminently adapted to poor, dry soils. It attains to maturity somewhat later in the season than its original common white kind.

VIII. The *stipiformis*, or SKEGS, is an exotic grain, that flourishes on the poorest soils, and is propagated by sowing it in the proportion of two Winchester bushels per acre. The crops produced by this species, generally amount to double the quantity of other oats ; though in weight they are only equal..... Skegs is reputed to afford a remarkably sweet and wholesome food for horses and cows, especially when given them together with the straw ; as likewise for ewes, before they drop their lambs, whether allowed in the straw, or chopped ; which latter method, however, is more economical.

IX. The *Tartarian*, or REED-OAT, is conjectured to be a species unnoticed by LINNÆUS. It appears to be well calculated for land that has been exhausted by an injudicious rotation of crops, and will also thrive on a stiff soil, where the common white-oat does not prosper. Its grain is much inferior to the generality of oats: nor does it ripen so early, or afford an equal proportion of meal; but its straw is very luxuriant, and the grain is not easily scattered by the wind.

X. The *Friesland* and *Poland-oats*, which have received their names from those respective countries, are chiefly distinguished by their coming early to maturity.... They, however, thrive only on the richest soils; easily shed their grain, when ripe; and afford a very indifferent meal, though they sometimes yield an astonishing increase. The quantity usually sown is, seven or eight bushels of the Poland, or six of the Friesland-oats, per acre, in the month of March or April: these species are chiefly consumed in feeding horses.

There is a variety of the Poland grain, first raised in Scotland, and which is called *Church's-oat*. It is greatly esteemed in Northumberland, as being the best of the earlier sorts, hitherto known for sowing on loamy lands in good condition. This variety is very productive, and ripens early: it is known by the grains being remarkably short, round, plump, and well filled: it yields an excellent meal, and is easily converted into flour.

Oats are subject to the *smut*, and various other diseases, and also to the depredations of numerous insects, in common with wheat, barley, &c. (see vol. ii. p. 214); but they are most materially injured by a kind of grub, which peculiarly attacks them. This pernicious insect comes into existence, if the autumn has been warm, toward the end of October; and progressively increases in size till the beginning of winter; during which it continues stationary, without being injured by the most intense cold.... Towards the end of February, the grub recommences its devastations, and gradually becomes larger till early in May, when it is more than an inch long, and one-third of an inch in circumference. At this period, it commits the greatest depredations, cutting, in a very short time, through the strongest stalks of grain.

In the summer, the oat-grub undergoes similar transformations with the caterpillar. While in its reptile state, this pernicious insect is almost invulnerable, and the fly is equally hardy. The only period, when it is susceptible of injury, is during its passage from the state of a grub to that of chrysalis, about the end of May, or early in June, at which time rain and cold weather equally accelerate its destruction. And, as considerable quantities of rain fall during those months, almost the whole race perishes, excepting such as may have settled in soft, dry mole-hills, or on the coarse noxious weeds vegetating at the sides of ditches; and the seeds of which are wafted into the contiguous fields, whither the eggs of the grubs are conveyed.

These destructive insects appear every year, but chiefly in wet situations: they are more or less numerous, according to the heat or cold of the former season. Were it not, indeed, for the vernal showers, which fall at the period above mentioned, such devastations would

be irreparable. Nor has any better method of destroying them been discovered, than to clear every hedge and ditch of all coarse, rough weeds, and herbage; for, as the latter afford shelter to the insects during the winter, they annually send forth a fresh stock, which neither fallowing nor any other attention can exterminate: thus, the soil is constantly infested with them, and much labour and expense are incurred, that might, with a little diligence on the part of the farmer, be effectually saved.

All the species of oats are very hardy plants; and, as, we have already observed, will flourish on almost every soil. Their strong roots, striking to a considerable depth, open the earth, and thus, when ploughed in, loosen it for other vegetables. But though the general practice is to sow oats between the months of Febuary and June, yet they may be advantageously committed to the ground late in autumn, especially in mountainous situations; for they will thus not only ripen earlier, but will be enabled to resist the violence of the equinoxial winds. Farther, it appears that *unripe* seeds, (namely, such grain as may have been cut before it was fully ripe, in consequence of the approach of frost), if carefully dried, will, on being sown in drills, yield as good crops as corn that has attained to its full maturity. This practice has been successfully proved by Mr. Duckett; and, as it may be applied to *wheat*, it promises to be attended with the greatest advantage to farmers in exposed situations; as they may thus make use of their ripe grain for flour, while the thin corn will serve for seed.

When deprived of their husks, and formed into groats, oats are converted into an excellent dish for the infirm and diseased. When ground into meal, and boiled in water, they afford a thick and nourishing mucilage, which with the addition of a few currants, is very wholesome, and produces a mildly laxative effect.

OCHRE, in natural history, a genus of argillaceous earths, slightly coherent, and composed of fine, smooth, particles, rough to the touch, and readily diffusible in water.

Ochres are of various colours, such as yellow, red, blue, brown, green, &c.: they possess virtues somewhat similar to the calces of iron, and are principally employed as pigments.

ODOUR, is that property of bodies by which they affect the sense of smell at a distance, whether in a pleasant or disagreeable manner.

The faculty of distinguishing odours, doubtless has great influence upon the morals and on the disposition of the mind; hence Rousseau justly terms it "the sense of imagination." Virey, a modern French writer, has devoted a particular treatise to the inquiry into the great effect of this sense, on the passion of love; and, in another paper, he examines the odours exhaled by living animals.

M. Prevost, an ingenious Frenchman, has lately discovered *a method of rendering the exhalations of odorous bodies visible*. This remarkable phenomenon was re-produced before the *National Institute* at Paris, by various experiments, that are equally simple and striking. A few drops of water are to be distributed at equal distances

from each other, on the surface of a glazed plate, or looking-glass..... Next, the odorous substance, for instance, a piece of camphor, is placed in the middle: among other effects, the water immediately retreats to a considerable distance, in a circle, from the exhaling body, so that the intermediate space becomes perfectly dry. In proportion to the strength of the smell, this interval will be more or less considerable, and thus serve as a measure or scale for ascertaining the intensity of the odour.

Oesophagus. See Gullet.

OIL, an inflammable, unctuous fluid, drawn from various natural bodies, belonging either to the mineral, animal, or vegetable kingdoms of Nature.

I. Mineral oil is that fluid denominated *petroleum*, or *naphtha*, of which we have already treated, under the article Bitumens.

II. Animal oils are obtained by distillation from the fat of animals, together with their volatile salts. They may also be procured from certain animal matters, by boiling and expression. Such are the train and spermaceti oils extracted from whales, porpoises, and other fish.

This class of oils is chiefly consumed in lamps; and as they are apt to become rancid, various means have been devised to edulcorate, or restore them to their natural state. Among the most easy expedients, are those contrived by Mr. Dossie, and published some years since by the *Society for the Encouragement of Arts*: they deserve to be more generally known:

1. Let one ounce of chalk, finely pulverized, and half an ounce of lime, slacked by exposure to the air, be put into a gallon of fetid oil; after which they must be carefully stirred, and half a pint of water gradually mixed. The stirring is to be repeated after an hour has elapsed, and at other convenient intervals, for two or three successive days. At the end of that time, a pint and a half of water, in which an ounce of salt has been previously dissolved, is to be incorporated with the ingredients in a similar manner, and the agitation occasionally renewed for one or two days. The whole is then suffered to stand at rest, when the water and chalk will be precipitated, and the oil will be considerably purified, though not so completely as by the following process:

2. Let an ounce of pulverized chalk be added to a gallon of crude, fetid oil, or to a similar quantity of the fluid prepared as above directed, and the whole be repeatedly stirred, as before described. After it has been mixed for several hours, one ounce of pearl-ashes, dissolved in four ounces of water, is to be added, and the stirring continued, at intervals, for some hours; when a solution of two ounces of salt, in one pint of water, must be added, and the agitation occasionally repeated during the next two days. Now, the mixture ought to stand for several days, when the brine will separate from the oil, which will be greatly improved both in smell and colour. Should a greater degree of purity be required, the proportion of pearl-ashes ought to be increased; and the period intervening between the addition of the salt and water prolonged: lastly, if the same operation be repeated, and the quantity of ingredients be reduced one-half each

time, the oil may be brought to a very light colour, and its smell rendered equally sweet as the common spermaceti.....By this treatment, the coarsest cod, or seal-oil, may be made to burn; and, though it be too putrid for use, it may be so far corrected by the first process, as to be in all respects equal to that commonly sold.

In the year 1798, a patent was granted to Mr. COLLIER, for a chemical process for freeing fish-oils from their impurities, in point of smell, taste, and colour; and also for improved strainers for oils and other liquids, &c. The whole is performed in the following manner: first, the patentee pours any quantity of fish-oil, or a mixture of different kinds of oil, into a vessel, which is heated to the temperature of 110 or 120 degree of Fahrenheit's thermometer; when a portion of caustic mineral alkali is added, the weight of which is equal to four parts to the hundred of the oil. The mixture is next agitated; and after the sediment and salt have subsided, it is drawn off into another vessel, containing a sufficient quantity of finely pulverized, fresh-burnt charcoal, and a small proportion of diluted sulphuric acid. The agitation is repeated; and, when the coal, together with the saline and aqueous particles, have subsided, the oil is passed through certain strainers, and thus rendered perfectly transparent and fit for use.....Such is the patentee's process; but, as a description of the vessels employed in edulcorating oil, would be unintelligible, without the aid of an engraving, the reader will consult the 10th volume of the *Repertory of Arts*, &c.; where the patent is fully described, and illustrated with a plate.

In April, 1792, a patent was granted to Mr. CHA. GOWER, for his method of depurating and improving animal oil. He directs equal quantities of oil, and of water previously acidulated with a due proportion of vitriolic acid, to be poured into a barrel or other vessel, which must be placed near a fire, and briskly agitated, in order to unite the two fluids. The liquor is then passed into pans, with a view to complete the solution of the gelatinous parts; and that the water may sink to the bottom; when the clear oil is decanted. Should, however, the oil intended to be purefied have a *turbid*, or *ropy* appearance, the patentee directs equal parts of such liquid, and pure water, to be mixed with a little yeast, and shaken in the manner above-mentioned. When the fermentation ceases, the whole must be poured into similar pans, where the feculent particles will subside, and the oil float on the surface, whence it may be drawn off for use.

Besides its utility for lamps, animal oil possesses a valuable property which deserves attention. If one drop be laid on a bug, fly, wasp, or earwig, it will cause the immediate death of those troublesome vermin; and, even when it is damaged, it may, according to Mr. BUCKNALL, be advantageously applied to fruit-trees, about a month after they have been washed with soap-suds, in order to eradicate *moss*.

III. VEGETABLE Oils are procured either by expression, infusion, or distillation.

1. Those by expression are obtained from the seed, leaves, fruit,

and bark of plants; which, being pounded in a mortar, the oil is forced out by means of a press, without the aid of heat. Such are the oils of olives, almonds, beech-mast, rape, and linseed.

2. In essential oils procured by infusion or decoction, the virtues of some particular plants are extracted. To this kind belong the oils of roses, chamomile, &c.; which, however, ought to be boiled only so long as there remains any aqueous moisture, for otherwise they will become black.

3. Other essential oils of vegetables are prepared by distillation, only from those plants, or parts of plants, that possess a considerable odour. They contain the fragrance, warmth, pungency, and often the active powers of the substance from which they are drawn; whence they have received the name of *essences*, or *essential oils*; for instance, those of cloves, cinnamon, &c....See ESSENCE.

As many of these oils are expensive, and frequently adulterated with alkohol, or with expressed and inferior essential oils, we shall point out a few methods by which such practices may be detected.

1. If there be reason to suspect that an essence is sophisticated with *alkohol*, or rectified spirit of wine, it will be advisable to pour a few drops into a glass of pure water; and, if it be actually a base mixture, the whole will now become *milky*; and, on repeatedly agitating the glass, all the spirituous part will be absorbed by the water, while the genuine oil will float on the surface.

2. If the adulteration be effected by the aid of an *expressed* oil, the fraud may be discovered, by simply adding a little spirit of wine to a few drops of the suspected oil, and shaking them together: for the spirit will dissolve all the essence, or that obtained by distillation, while the expressed oil will not be in the least affected.

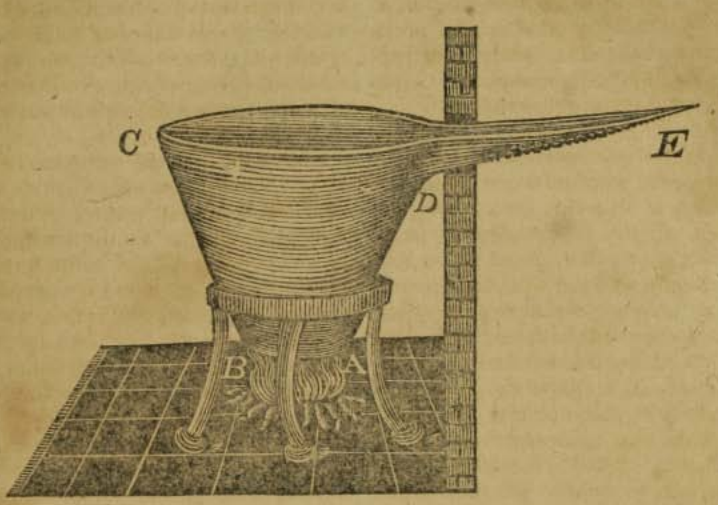
3. Lastly, if an essential oil should have been mixed with a cheaper or inferior essence (which is usually effected by distilling oil of turpentine with the herbs from which the essential oil is drawn), the imposition will speedily and spontaneously appear. But there is a more expeditious mode of detecting it; namely, by dipping a piece of rag, or paper into the suspected essence, and holding it before the fire: when the grateful fragrance of the plant will be volatalized, and the scent of the turpentine will remain.

On the properties or virtues of essential oils, we cannot enter in this place; for, as they correspond with those of the substance from which they are obtained, the reader will, in particular instances, resort to their alphabetical series.....See also MENSTRUUM.

[For observations on the utility of OIL in preserving timber from decay....See TIMBER.

Serious accidents frequently occur from vessels containing oil, and other inflammable fluids boiling over, and setting fire to the surrounding buildings. To prevent these, the following form of a vessel, has been recommended by the late lamented T. P. SMITH, in the *Transactions of the American Philosophical Society*: vol. 4.

Let A B C D, represent a large Kettle; D E, a spout running out to the distance of three or four feet, commencing at D, four or five inches from the brim of the kettle,



and the termination of it E, just as high as the brim C. Let the bottom of this spout be covered with wet sponges, or rags. Now, suppose the kettle to be filled up to D, with any fluid, then as soon as it commenced boiling, it would rise in the kettle, and in rising but a small perpendicular height, would pass a considerable distance up the spout D E; here the liquor would soon cool, and of consequence fall back into the kettle, and the whole subside to its original height..... This would occur as often as the fluid rose above D, as the evaporation from the wet sponges or rags, would keep D E constantly cool.... it would perhaps be best to pass the spout through the side of the building into the open air, as thereby the evaporation would be increased, and consequently the spout kept at a lower temperature; in this case it might be covered.

In case of the fluid to be boiled possessing a very strong elective attraction to caloric, (matter of heat,) the spout may be extended to the width of the diameter of the kettle, or a projecting shelf might be formed all around it, lined below with wet sponges or rags.]

OINTMENT, a preparation consisting of certain unctuous matters, whether animal or vegetable, for the cure of sores, burns, ulcers, and tumors.

Ointments differ from plasters only in their consistence: those prepared of animal fat appear to be more congenial to the human system, than such as are compounded with vegetable oils; though the former are more liable to become rancid by long keeping, and ought, therefore, to be applied when in a fresh state.

In the preparation of ointments, the fat and resinous substances

ought first to be melted in a gentle heat, over which they should be carefully stirred, when such dry ingredients as may be necessary (being finely pulverized), must be gradually sprinkled in; till, on diminishing the heat, the mixture become stiff.

Simple Ointment consists of five parts of olive-oil, and two parts of white-wax, thoroughly incorporated.

Ointment of Hog's-lard is prepared by triturating two pounds of hog's-lard with three ounces of rose-water, till they are perfectly mixed. The whole should now be melted over a moderate fire, and suffered to subside, when the lard must be poured off, and constantly stirred, till it become cold.

Both these ointments may be used for softening the skin, and healing chaps. The former, however, being of a more uniform consistence, is preferable to the latter: but too large a quantity of either ought not to be prepared at one time; because, when they have been kept for some months, or even a few weeks, they lose their healing properties.

VAN MONS has devised a new, and less troublesome, method of compounding ointments and plasters, in which fresh herbs, or their expressed juices are employed as ingredients. The vegetable sap ought previously to be strained, and deprived of all feculent matters: next it is placed over a very moderate fire, in a shallow earthen vessel, where it is evaporated nearly to dryness: this coagulated extract is now baked or dried in an oven, so that it may be reduced to powder; in which state it is again exposed to the fire together with the fat or oil intended for its vehicle, till the humidity is completely evaporated. For a cheap and useful *family ointment*. See BURNS.

OLD-AGE. See LONGEVITY.

OLIBANUM, a gummy-resinous substance, obtained from the *Juniperus lycia*, L. It is imported from the Levant, or the East Indies; consisting of drops or tears, resembling those of MASTICH, though rather larger: they are of a pale-yellowish, and sometimes reddish-colour, possess a moderately warm pungent taste, and a strong though not agreeable smell.

Olibanum consists of about equal parts of gummy and resinous matters; the former of which are soluble in water, and the latter in rectified spirit.

Many virtues were formerly attributed to this drug, which it does not really possess.

OLIVE-TREE, or *Olea*, L. a genus of plants, consisting of six species, the principal of which is the *Europæa*, or Common Olive-tree. It is a native of the Southern parts of Europe, especially Italy, France, Spain, and Portugal, where it is cultivated to a very considerable extent, on account of its fruit, from which the *sweet* or *salad oil* is extracted; and which also, when pickled, forms an article of food. This tree, however, produces no fruit in Britain, even in hot-houses, and as it is planted only in the gardens of the curious, we shall confine our account to the properties of olives, and to the oil obtained from them.

Olives possess, in their natural state, an acrid, bitter, and extremely disagreeable taste; which, however, is considerably improved when this fruit is pickled. The Lucca olives being smaller than any other, have the weakest taste;

the larger ones, imported from Spain, are the strongest ; but the most esteemed are the olives of Provence, which are of a middling size, and not so strong as those of Spain. On account of the great quantity of oil they contain, all these varieties, if eaten by persons of delicate habits, are extremely hurtful, especially if taken by way of dessert, after a solid or heavy dinner.

As an article of food, *olive oil*, is preferable to animal fat; but it ought always to be mild, fresh, and of a sweet taste. It should not, however, be eaten by persons of weak stomachs ; for, even in its mildest state, it produces rancidity and acrimony, which are extremely injurious to digestion. Olive-oil is chiefly used in salads, and should always be consumed together with a large portion of bread, or with the addition of sugar, on account of its richness ; as otherwise it requires a powerful and active bile to assimilate it to alimentary matter.

Medicinally considered, olive-oil has lately been found an excellent preventive of the plague, when rubbed over the whole body immediately after the contagion is supposed to have taken place. It is also beneficially employed internally for *recent* colds, coughs, hoarsenesses, &c. whether mixed with water into an emulsion, by means of alkalies, or with conserves or syrups into a *linctus*..... Lastly, considerable quantities are used in the preparation of plasters, ointments, &c. for external applications.

[The following excellent observations upon the culture of this INVALUABLE TREE, were addressed by THOMAS JEFFERSON, in July 1787, to the Agricultural Society of Charleston, South-Carolina, and published in a little pamphlet by that association, shortly after..... Neither the advice, nor liberal offer contained in the communication, were attended to.

" The Olive is a tree the least known in America, and yet the most worthy of being known. Of all the gifts of heaven to man, it is next to the most precious, if it be not the most precious. Perhaps it may claim a preference even to bread ; because there is such an infinitude of vegetables, which it renders a proper and comfortable nourishment. In passing the Alps at the Col de Tende, where they are mere masses of rock, wherever there happens to be a little soil, there are a number of olive-trees, and a village supported by them. Take away these trees, and the same ground in corn would not support a single family. A pound of oil, which can be bought for 3*d*. or 4*d*. *sterling*, is equivalent to many pounds of flesh by the quantity of vegetables it will prepare, and render fit and comfortable food. Without this tree the county of Provence, and territory of Genoa would not support one half, perhaps not one-third, of their present inhabitants.* The nature of the soil is of little consequence, if it be dry. The trees are planted from 15 to 20 feet apart, and when tolerably good, will yield 15 or 20 pounds of oil yearly, one with another. There are trees which yield much more. They begin to render good crops at 20 years old, and last till killed by cold, which happens at some time or other, even in their best positions in France : but they put out again from their roots. In Italy, I am told, they have trees

200 years old. They afford an easy, but constant employment through the year, and require so little nourishment, that, if the soil be fit for any other production, it may be cultivated among the olive-trees, without injuring them. The northern limits of this tree are the mountains of Cevennes, from about the meridian of Carcassonne to the Rhone; from thence, the Alps and Appenines as far as Genoa, I know, and how much farther I am not informed. The shelter of these mountains may be considered as equivalent to a degree and a half of latitude at least; because westward of the commencement of the Cevennes, there are no olive-trees in 43°½, or even 43°, of latitude; whereas we find them *now* on the Rhone at Pierrelatte in 44°½, and *formerly* they were at Tains, above the mouth of the Isere in 45°, sheltered by the near approach of the Cevennes and Alps, which only leave there a passage for the Rhone. Whether such a shelter exists, or not, in the states of South-Carolina and Georgia, I know not. But this we may say, that either it exists, or that it is not necessary there..... because we know that they produce the orange in open air; *and wherever the orange will stand at all, experience shews the olive will stand well, being a hardier tree.* Notwithstanding the great quantity of oil made in France, they have not enough for their own consumption, and therefore import from other countries. This is an article, the consumption of which will always keep pace with its production. Raise it, and it begets its own demand. Little is carried to America, because Europe has it not to spare, we therefore have not learnt the use of it: But cover the southern states with it, and every man will become a consumer of it, within whose reach it can be brought in point of price. If the memory of those persons be held in great respect in South-Carolina, who introduced there the culture of rice, a plant which sows life and death with almost equal hand, what obligations would be due to him, who should introduce the olive-tree, and set the example of its culture! Were the owners of slaves to view it only as the means of bettering their condition, how much would he better that by, planting one of those trees for every slave he possessed! Having been myself an eye-witness to the blessings which this tree sheds on the poor, I never had my wishes so kindled for the introduction of any article of new culture into our own country. South-Carolina and Georgia appear to me to be the states, wherein its success, in favourable positions at least, could not be doubted; and I flattered myself, it would come within the views of the society for agriculture to begin the experiments, which are to prove its practicability. Carcassonne is the place from which the plants may be most certainly and cheaply obtained..... They can be sent from thence by water to Bordeaux, where they may be embarked on vessels bound for Charleston. There is too little intercourse between Charleston and Marseilles, to propose this as the port of exportation. I offer my service to the society for the obtaining and forwarding any number of plants, which may be desired."]

OLIVE the *Spurge*. See MEZEREON.

ONION, the COMMON, or *Allium Cepa*, L. an exotic plant, probably originating from Asia.

There are several varieties of the common onion, the principal of which are known by the names of Strasburgh, Spanish, and Egyptian. They are propagated by seed, which ought to be sown towards the end of February, or early in March, during dry weather; in the proportion of six pounds per acre, on light rich land, that has previously been well dug, levelled, and cleared from all weeds. In the course of five or six weeks, the onions will appear above ground; and, after growing a month, they will, in a good soil, admit of being hoed; which operation must be performed with a small implement, not exceeding 2½ inches in breadth; and it will also be necessary to remove such as may stand too closely together, so as to leave the rest about three inches asunder. At the expiration of another month, the hoeing ought to be repeated, and the plants left four or five inches apart: in the course of six weeks, the hoe is once more employed; the weeds are carefully removed; and the onions suffered to grow only at the distance of six inches square; by which means they will attain a very large size.

Should the weather continue dry, the operations before stated, will be sufficient, till the onions are ready to be pulled, but, if the season prove damp, and weeds vegetate luxuriantly, they must be removed by the hand; because, after the onions have begun to *bulb*, it would be improper to stir them with a hoe. Towards the middle or latter end of August, they generally cease to grow; a circumstance which may be ascertained by the shrinking of their blades: it will, therefore, now be necessary to draw them out of the earth, to cut off the tops of the blades, and to dry them either in a warm place, or by exposing the bulbs to the sun; and turning them every second day, lest they should bud, as often happens in damp weather. This mode of cultivation is applicable to LEEKS, on the properties of which we have already treated, in their alphabetical order.

Beside the varieties above-mentioned, there is another, denominated *Welch Onions*, which are cultivated only for spring salad; as they form no bulbs. These are sown towards the end of July; and in the course of a fortnight appear above the ground; but in October their blades perish, and do not revive till January; when they shoot up vigorously; so that, in the month of March, the plants will be fit for the table.

[The success with which our New-England brethren, prosecute the *onion husbandry*, has long been known. The following directions therefore on the subject, from Mr. DEANE's *New-England Farmer*, deserve attention.

"The common sort of onions, have purple bulbs. The white or silver skinned, which are supposed to have come from Egypt, are by some preferred to the other. They have not so strong a taste.

This plant flourishes so well in the southern parts of New-England, that it has long been a considerable article of exportation; in the northern parts, it requires the very best culture.

A spot of ground should be chosen, which is moist and sandy; because they require much heat, and moisture. *A low situation*,

where the sand has been washed down from a neighbouring hill, is very proper. The most suitable manures are old rotten cow dung, ashes, but especially soot. A small quantity of ashes or sand, or both, should be spread over them after sowing, especially if the soil be not sandy. And it is not amiss to roll the ground after sowing.

I have many years cultivated them on the same spot; and have never found the land at all empoverished by them. But on the contrary, my crops are better than formerly. But the manuring is yearly repeated; and must not be far below the surface.

The ground should be dug or ploughed in autumn, not very deep; and then made very fine in the spring, and all the grass roots, and roots of weeds taken out; then laid in beds four feet wide. Four rows of holes are made in a bed, the rows ten inches apart, and the holes in the rows ten. About half a dozen seeds are put in a hole, or more if there be any danger of their not coming up well, and buried an inch under the surface. This is allowed by the experienced cultivators in Connecticut, to be the best way of setting the seeds. For they will grow very well in bunches.... They crowd each other up out of the soil, and lie in heaps as they grow upon the surface. The largest onions are those that grow singly, some inches apart; but those that are more crowded, produce larger crops. The middle sized onions, are better for eating than the large.

The last week in April is the right season for sowing the seeds, if the ground be capable of being put into proper order so early. In wet ground it is often necessary to sow later.

Last year, (1789,) I sowed my onions in drills 12 inches apart, across the beds: my crop was near double what it used to be, when they were sowed in bunches. I gave them a slight top-dressing of soot, just before they began to form bulbs, which might be the true reason of the great increase: so that I do not yet absolutely prefer the drill method to the other.

Onions should be hoed three or four times, and kept quite clear of weeds, before the tops arrive to their full height. At this time the bulbs will begin to swell: hoeing should therefore be laid aside, and the weeds pulled up by hand, as often as they appear. Weeds not only rob the plants of their food, but injure them much by their shade.

To promote the growth of the bulbous roots, I have found it advantageous to trample the ground hard between the rows or bunches, and to draw the soil away from the bulbous roots, laying them bare to the sun. They are thus more warmed, and grow faster.

Some think it necessary, to pass a roller over beds of onions, or cripple down their tops by hand. But I have never been able to find the least advantage from either of these methods. Nor do I think they ought to be practised; for I cannot easily conceive how the crushing and wounding any plant while it is growing, should conduce to its improvement. Though some may have good crops who treat them in this manner, I am persuaded that if they neglected it, they would have much better. For, besides the mischief already men-

tioned, the sun is shut out from the bulbs by crushing the tops down upon them; but the more upright the tops are, the more the sun will shine upon the roots.

Others shake and twist the tops, to loosen the bulbs in the soil, which I cannot approve of: For if it do not snap off some of the fibrous roots, it gives too free a passage of the air to them, by which if dry weather follow, they will be injured.

When onions are thick necked, do not incline to bottom, but rather to be what are vulgarly called scallions, the more care should be taken to harden the ground about them, and to lay the bulbs bare to the sun. And it may be proper to let them touch the soil, only in that part which sends out the fibrous roots.

At the worst, if they fail to have good bottoms the first year, and chance to escape rotting till spring; they may get them by being transplanted. Even an onion which is partly rotten will produce two, three, or four good ones, if the seed stems be taken off as soon as they appear. They ripen earlier than young ones, have the name rare-ripes, and will sell at a higher price.

When the greenness is entirely gone out of the tops of onions it is time to take them up: for from this time the fibrous roots decay, and no longer convey any nourishment to the bulbs, as appears by their becoming quite loose in the soil, and easy to take up.

After they are pulled, they should lie on the ground for ten days or a fortnight, to dry and harden in the sun, if the weather be fair..... Then, in fair dry weather, be moved into a garret, and laid thin..... The scallions should not be mixed with the good onions, lest they cause them to rot; but be hung up in some dry place in small bunches.

That onions may keep well through the winter, they should have a situation dry and cool..... Moisture soon rots them, and warmth causes them to vegetate. A degree of cold which would ruin most other esculent roots, will not injure them. Accordingly in the southern parts of this country, as I am informed, they are usually kept through the winter in dry casks placed in chambers or garrets..... But they should not be removed while the weather is very frosty.

When onions are kept long, they are apt to sprout. To prevent this, nothing more is necessary than to sear the fibrous roots with a hot iron. The pores of the roots will thus be stopped, through which the air enters, and causes them to vegetate.

To obtain seed from onions; plant the largest and soundest, in beds nine inches apart. In a month, the tops will appear; and every one will send up several stems.... When the heads of the flowers begin to appear, each plant must have a stake about four feet long, and its stems loosely tied to the stake by a soft string: otherwise, the heavy tops will lay the stalks, or the winds break them. *Keep the beds clear of weeds.*]

The properties of onions in no respect differ from those of garlic, excepting that the former are less pungent (see GARLIC,) and are, therefore, more generally used for culinary purposes. Many persons, however, dislike them on account

of the strong and disagreeable smell which they communicate to the breath : but this inconvenience may be obviated by eating a few raw leaves of parsley, immediately after partaking of onions, the scent of which is thus completely removed, and they are at the same time rendered more easy of digestion.

Onions were formerly reputed to be an efficacious remedy for suppressions of urine, and in dropsical complaints; but they are at present chiefly used in external applications, such as poultices, or cataplasms for suppurating tumors, &c. A distilled water from these roots is frequently recommended on the continent, as an excellent solvent of the stone and gravel.

Ophthalmy. See Inflammation of the Eye.

OPIUM, an inspissated gummy resinous juice, which is obtained from the White Poppy (*Papaver album v. somniferum*, L.) a plant cultivated in Persia and Arabia, where it attains the height of 20 or 30 feet. When the heads are nearly ripe, they are wounded on one side by an instrument furnished with five edges, which make an equal number of incisions: whence the opium flows by the action of the sun's heat, and is collected on the following day, by a person who wounds the opposite side of the head; from which the juice exudes, and is received in a similar manner. As soon as it is collected, the opium is moistened with a little water or honey, and is kneaded with the hand, till it acquires the consistence of pitch ; after which it is formed into cakes or rolls for sale.

The best opium is imported from the province of Bahar, in the East Indies, though it appears from experiments, that this drug may be advantageously prepared in England ; and the Patriotic *Society for the Encouragement of Arts*, &c. having offered liberal premiums to obtain so desirable an object, we propose to give a concise account of the methods adopted by the successful candidates, under the article Poppy.

Opium is very ponderous ; of a close and compact texture ; rather moist ; and of a deep brown colour. It emits a feint smell, and has a very bitter acrid taste : the best sort is of a moderate firmness, possessing a very powerful odour, and a bitter, disagreeable flavour. This narcotic drug is at present greatly esteemed ; and, whether used in the extract made into pills, or in the liquid form of Laudanum, it is one of the most valuable medicines. Being a very powerful antidote, as well as a remedy for procuring sleep and mitigating pain, it is but too often abused. If conjoined in certain proportions with vegetable acids, it possesses the remarkable property of preventing sleep, and exciting the mental powers. On this account, it has often, though injuriously, been employed by those who are obliged to devote their nights to sedentary or active pursuits....See also Acids.

Among the various disorders, in which opium has been given, with good effects, we shall first mention diarrhœas, and dysenteries. It has likewise been found serviceable in relieving the tooth-ach ; in allaying the pain and preventing the fever arising from wounds, fractures, or similar accidents ; and also in the small-pox, both where the patient is troubled with convulsions, before the appearance of the eruption, and on the fifth or subsequent days.

But as it is, on the whole, a precarious remedy, its *proper* use can be determined only by the expert practitioner.

Opium is the most certain antispasmodic hitherto discovered; and, when conjoined with laxatives, is eminently useful in colics ; as, by relieving the spasm, it frequently prevents inflammations of the bowels.....Lastly, it is of the greatest service in the different species of *tetanus*, and LOCKED JAW ; and affords relief in the various spasmodic affections attending indigestion, hypochondriasis, the bite of a mad dog, &c. ; it facilitates the passage of calculi, or stones, through the ureters, and has been found useful in some species of epilepsy.

But, though opium be thus valuable, it should no tbe taken in too large doses, or without medical advice ; as it is not unfrequently productive of the most fatal consequences. If, however, any quantity be swallowed, or suspected to have been swallowed, either accidentally, or with a design to terminate existence, its effects will become evident by vomiting, delirium, vertigo, and an irrestible propensity to sleep. In such case, friction with salt has been found serviceable, in restoring the patient to a slight degree of animation ; immediately after, it will be necessary to exhibit 12 grains of vitriolated zinc, if he be an adult. This medicine should be succeeded by water-gruel, or similar mucilaginous drink, or butter-milk, sour whey, and particularly vinegar, or strong coffee, which last appears to be the most effectual antidote. The cold bath, and the application of blisters to the head, have likewise produced beneficial effects in recovering persons poisoned with this drug.

It has been proved, from the Custom-house lists, and other sources of information, that a larger quantity of *opium* is annually used in Great Britain, than in all other States of Europe, collectively.

[It is a melancholy fact, that this excellent, kind assuager of our bodily pains, and mental distress, is frequently used for the horrid purpose of self-destruction. The remedies are in the first instance, powerful emetics of *white vitriol* ; twenty grains of which should be given as soon as called, in a wine glass of warm water, and repeated every ten minutes, until copious vomitings are excited. Warm water is then to be freely given, together with a smart purgative of rhubarb or jalap, joined with a few grains of pot-ash.

When no remedy has been given for some time, and symptoms of apoplexy have come on, the remedy is *copious bleeding*. This has been successfully used in four cases, by Dr. RUSH, who remarks, that it should never be prescribed, until great morbid action, or the suffocation of action from excess of stimulus, (manifested chiefly in the depressed state of the pulse), have taken place...See *Med. Repos. vol.* 5.

OPODELDOC, a well known liniment, which is prepared by digesting 3 parts of soap in 16 parts of the spirit of rosemary, till the former be dissolved ; when one part of camphor should be incorporated with the whole.... This unguent is of great service in bruises, rheumatic affections, and similar painful complaints; but, being very volatile, it ought to be kept in bot-

tles closely stopped, to prevent the access of air.]

ORACHE, or *Atriplex*, L. a genus of plants, comprising seventeen species; of which the following are the principal, and indigenous:

1. The *portulacoides*, SHRUBBY-ORACHE, or SEA-PURSLANE; growing on sea-shores; flowering in the months of July and August.....It may be easily propagated from cuttings; as it requires but little culture, and thrives well if planted in a poor gravelly soil, where it seldom attains above two and a half, or three feet in height, and becomes very bushy: hence it is well adapted for gardens, among other low shrubs, where it displays a very pleasing appearance. Being a marine vegetable, its ashes contain a large proportion of alkaline salt, and may, therefore, be usefully substituted for soap.

2. The *hastata*, WILD ORACHE, FAT-HEN, or LAMB'S QUARTERS, which grows on rubbish, dunghills, and in kitchen-gardens: it flowers in the months of August and September. This plant is sometimes used as a substitute for spinach and other greens, though it is not relished by cows, goats, sheep, or swine.

3. The *laciniata*, or FROSTED-ORACHE, which thrives on sea-shores, and flowers in July or August. The fruit of this annual plant contains a viscid yellow juice which, according to SCHOEPF, a respectable German writer on pharmacy, possessing similar properties with the exotic drug, termed *Gummi-Guttæ*. Hence it may be substituted for the latter, as a very powerful purgative in cases, where aqueous humours are to be evacuated; namely, in obstinate quartan agues, the humid asthma, melancholy, and especially in the dropsy: it may be given in conserves, pills, or powders, from four to eight grains for a dose.

ORANGE-TREE, or *Citrus Aurantium*, L. an exotic shrub, highly esteemed on account of its pleasant and cooling fruit.

The Orange-tree is divided into several varieties, of which the most esteemed are those of *China* and *Seville*: it is seldom raised in Britain, excepting in the hot-houses of the curious; and, its culture being the same as that of the CITRON, we refer the reader to that article.

The *flowers* of the orange-tree are highly esteemed, on account of their odoriferous perfume: they are of a slightly pungent, bitter taste, and communicate their flavour, by infusion, to rectified spirit; and also, by distillation, both to spirit and water. Formerly they were in great repute, on account of their supposed efficacy in convulsive and epileptic cases, though later experience has not confirmed these advantages: similar virtues have been attributed to the *leaves* which have likewise been found ineffectual in those complaints.

The juice of oranges is a pleasant sub-acid liquor, which has often proved of service in inflammatory or febrile disorders; by diminishing heat, allaying thirst, and promoting the salutary discharges. It is likewise eminently useful in the scurvy, and has, therefore, been introduced into the Navy, as part of the stores of ships destined for long voyages.

Nor is the outer rind less valuable, as it forms the basis of an excellent conserve; and, when preserved with sugar, is deservedly

esteemed in desserts, being a grateful aromatic bitter, and one of the best stomachics....There is also an oil expressed from the orange-peel, which is sold under the name of *Bergamot*.

From the flowers of this tree, an essential oil is prepared in Portugal and Italy, termed *Essentia Neroli*: this perfume is said to possess a more delicate and agreeable fragrance than even the *Otter of Roses*; but it is with difficulty procured in Britain.

Lastly, the Seville, or *Bitter Orange* is seldom employed in medicine at present; the China orange being generally substituted.

[ORANGE-WINE. Take the expressed juice of eight Seville (sour) oranges, and having one gallon of water wherein 3 lbs. of sugar have been dissolved, boil the water and sugar for 20 minutes; skim constantly, and when cooled to a proper heat for fermentation, add the juice and the outer rind of the oranges thinly shaved off, and putting all into a barrel, let it be frequently stirred for two or three days, and then close bunged for six months or longer before bottling. Communicated by S. W. Johnson, Esq.]

ORCHAL, Argol, or Cudbear; *Lichen Roccella*, L. an indigenous plant, growing upon the rocks on the coast of Guernsey; the Isle of Portland; and, we understand, also in some parts of the Highlands of Scotland....This species attains the height of two or three inches, having cylindrical stems, which are internally white. It abounds on the islands of Teneriffe, and the Canaries, whence it is imported into Britain.

Argol is of a light colour, though it is sometimes found of a dark-grey; when mixed with lime, urine, and alkaline salts, this moss is formed into a dark-red paste, which has received the different names above-mentioned, and is much used in dyeing wool of a deep red or purple colour.

ORCHARD, in horticulture, a tract of land appropriated to the growth of standard fruit-trees, with a view to furnish a supply of the most useful kinds of fruit.

Orchards are sometimes confined to the cultivation of apples, pears, cherries, or other particular fruit, especially if they be situated in the vicinity of a town or city: more frequently, however, they are composed of all the trees before mentioned, with a double proportion of those bearing apples; which doubtless are the most plentiful and valuable fruit, that may be easily preserved during the whole year.

The utility of a *general* orchard, both for domestic use and the sale of its productions, is evident to the most superficial observer, independently of the beautiful appearance it presents, from an early period in the spring to the late autumn :.... we shall therefore state a few hints, from *practical* writers, and *actual* experience, on the proper management of this most important department of economy.

I. Extent, Situation, and Soil.

The *extent* of an orchard should be proportioned to that of arable land, and the quantity of fruit required either for private use, or the supply of public market; so that the plantation may consist of from half an acre to 20 acres. As, however, there are many friends of horticulture, whose possessions confine them to a small compass;

and who, nevertheless, wish to practice this useful art on a systematic plan; we have subjoined, at the conclusion of these observations, a second Cut, in which the proper place of each tree is accurately represented; and the most valuable fruit-trees are distinctly pointed out.

The *situation* and *aspect* may vary according to circumstances, provided the soil be good. All low, damp, exposures, however, ought to be purposely avoided, as no fruit-trees will flourish there; nor can their productions be fine or well flavoured. A moderately low situation, therefore, is preferable to elevated lands, provided it be *dry*; because it will thus be sheltered from the effects of tempestuous winds; though a small declivity will be very desirable, especially if its aspect incline towards the East, South-east, or to the South; which situations are always more eligible than a western exposure. But a northern aspect ought by no means to be selected, unless it be well sheltered, or the ground be particularly favourable to the formation of an orchard.

[The above directions respecting the choice of situation, for an orchard, are left in, to keep the reader in mind of the necessity of caution in following the directions of European writers on Agriculture. Under the article FRUIT, vol. iii. p. 108, ample reasons were given for prefering a northern situation for apple trees.]

With respect to the *soil*, any common field, or pasture, which produces abundant crops of corn, grass, or culinary vegetables, may be chosen for laying out an orchard. If it be of a rich loamy nature, it will be of great advantage; though any soil of a good quality may be prepared for the purpose; but, it must be neither too wet or heavy; nor too light or dry: it should be soft, easily worked, and have at least one spade deep of vegetable mould.

[The choice of a proper soil, and exposure, is not sufficiently attended to, in the United States. Mr. RILEY of Marcus Hook, whose experience in *Cyder*, is inferior to none, assures the Editor, that apples growing in a good loose soil, produce much more rich and generous liquor, than those that grow in a stiff clayey land.]

II. PREPARATION OF THE LAND. This primary object of horticulture, is usually effected by *trenching* if the plantation be intended for private use. In the preparation of very extensive orchards, it will be advisable to plough the soil to a considerable depth; but the most eligible method is, to dig trenches, one or two spades deep, according to the nature of the ground, and six or eight feet wide in each row, where the trees are in future to be placed; especially if it be grass-land, and intended to be kept *in the sward*; in which case the green-sods must be laid at the bottom of each trench; because, when putrefied, they will afford an excellent manure. Should hops, or any other under-crop, be designed to be raised, it will be requisite to trench the whole of the ground; but, in either case, the spade must be carried to the depth of the natural soil.

The land thus managed, ought likewise to be secured from the incursions of cattle, by means of a good ditch, [fence] and a well-planted hedge, which should be trained towards the north, as high and as

thick as it can be carried. The plantation ought, also, to be screened on the east and west sides from the effects of boisterous winds, by means of *shaws* or shelters of Spanish chesnut, Scotch firs, ash, or other quick growing trees.

Manure is likewise an object of the greatest importance; and, for this purpose, the sweepings of streets, those of cow and slaughter-houses, the emptying of drains and night-soil, are, in the opinion of Mr. BUCKNALL, eminently serviceable; as they "are more disposed to facilitate the growth and health of fruit-trees, than the manure from the stable."

[The following statement of the surprising resuscitation of an old worthless apple-tree appeared in the "*SALEM REGISTER*, of May 1802;" and is now republished, to shew what good effects may proceed from *manuring fruit-trees*. It is questionable, whether FORSYTH himself, could boast of a more signal instance of his art in recovering an apparently dyeing tree. It may be added in favour of the practise; that the gentleman, R. S. Esq. of Princeton, New-Jersey, who has remarkably fine peaches, regularly manures his trees every year, and asserts, that the speedy decay of common peach-trees is owing chiefly to a neglect of this practice. He even said, experience convinced him, it was owing to the same circumstance, that peach-stones did not in general, produce fruit like the original tree.

"In my garden is an apple-tree, which, about the year 1763, sprouted from the root of a former tree: it now girts three feet six inches: From 1784 to 1790, I observed it to be barren, and a cumberer of the ground; year after year being the prey of caterpillars, and exhibiting the constant appearance of innumerable warts within the outside bark, which, at the time, I suspected, was natural instinct in the insect for the propagation of its kind.

The garden, &c. did not fall under my particular care and cognizance, until 1792. In the spring of 1793, I tried an experiment for giving it new life, as follows: Very early in the season, I directed my gardener with a hoe to cleanse the outside bark of such excrescences, as might bear the operation with little difficulty: In the next place, I directed him to raise a wall of small stones round the tree, at the distance of one foot, and perhaps nine inches high: and then to fill the cavity with manure from the resource of compost.

The effect in the succeeding season was truly worthy of notice: the warts disappeared, the bark clean and thrifty, and the tree so loaded with fruit, as that about one third of the boughs broke and came to the ground with the cumbersome weight. Comparatively, no caterpillars since; and on an average, very plentiful of fruit yearly. I have not yet renewed the experiment, and think it would be well not to neglect it.

I was led to the experiment by taking notice of a pear-tree that had been in a very similar situation, and had been resuscitated in a similar manner."]

II. METHOD OF PLANTING.

The best season for planting fruit-trees is in autumn, shortly after the leaves begin to fall; from the latter end of October till the commencement of December;

though, if the weather continue *open*, or mild, it may be performed at any time between the months of October and March.

[In the United States, no general rule can be given, owing to the immense variety of climates with which we are favoured; in some states the autumn may be best, while in others, in Pennsylvania, it is probable that early in the spring answers best. Indeed in a comparative experiment, of spring and autumn planting, made near Philadelphia in 1802–3, the advantage was *considerably* in *favour* of those put down in the spring. Some planted in the autumn, were from a nursery near the city, and nearly all died; another parcel from the excellent nursery of Mr. PRINCE of Flushing, Long-Island, arrived late in April, and all survived; there was no reason to suspect any difference in the soil, or the care with which both parcels were planted.]

As many trees become diseased with the moss, canker, &c. in consequence of an injurious selection, Mr. B. directs them to be chosen the year before they are intended to be planted. The *orchardist*, he observes must be particularly careful to obtain *young* and *healthy* trees, for *cankered* plants emit a vapour which is very detrimental to such as are sound; he must, likewise, see them properly pruned in the nursery, so that all extraneous or rambling branches be closely taken off, and only three or four leading shoots be left to every head: thus managed, the trees will not require to be lopped for a considerable time; and, as they will have no wounds open in the year when transplanted, their growth will be greatly promoted.

On taking up the fruit-trees, the roots should be preserved of a convenient length, in consequence of which they will incline to grow in a horizontal direction, and be more immediately influenced by the sun: their sap will become richer, and produce the sweetest and most beautiful fruit.

In arranging the trees, Mr. BUCKNALL directs them to be planted conformably to the mode represented in the following Cut:

One row of the tallest and strongest standards is to be set on the three cold sides; parallel to which, must be planted another row of the next *free-growers:* then, the trees are to be disposed in a similar manner, according to their strength, gradually declining in size, to the center. Each standard is to be placed 33 feet asunder, between which two dwarf-trees should be planted; all of them being so pruned, that each row will, at the expiration of thirteen years, form an actual hedge of fruit. The intermediate spaces may be filled with hops, which should be removed, accordingly as the trees advance in growth.

Farther, the rows of trees ought to incline to a point of the compass towards the east; because the sun will shine upon them early in the forenoon, and thus dissipate the vapours, which arise during the vernal nights, and *stunt* the fruit in the earlier stages of its growth.

Having given this general outline relative to the planting of orchards, we should consider our work deficient on a subject of such importance, if we neglected the opportunity of communicating a more complete and systematic introduction to horticulture, with which we have been favoured by Mr. CHRIST, an eminent and practical German writer. In order to enhance the value of this essay, we have procured the subjoined Cut, which represents two rows of a design for an orchard occupying *two* acres of ground (Rhenish measure) that is, 19 roods in length, according to the horizontal rows; and 17 roods in breadth, conformably to the perpendicular lines

In an extensive orchard, the proprietor will find it more advantageous to place the fruit trees at a considerable distance; as, by such management, he will be enabled to train a greater variety of useful plants beneath and between those of a larger size. But, in a limited space of ground, such as that exhibited in the preceding Cut, the primary object will be to make the most economical use of the allotted ground, and to procure the greatest possible variety of fruit-bearing trees. Next he will endeavour to arrange them so that they may stand in symmetrical order, and exhibit a pleasing sight. For this purpose, the arrangement here proposed, in an irregular

square, will be found the most convenient and agreeable to the laws of vegetation. Thus, the eye, wherever it turns, not only perceives a straight line, and uniform groves, but the plan itself is likewise the most consistent; because each tree is planted, in a certain space, at the greatest possible distance from the other; and is, in this manner, less cumbersome to its neighbour, than it would be in a rectangular square. Hence the proper and most profitable disposition will be that of allowing three rods interval between standards, in the horizontal rows from east to west; and two and an half rods in the perpendicular lines from south to north. This space, however, would, after some time, become too narrow; one tree would impede the growth of another, and, by obstructing the air as well as the rays of the sun, prevent the ripening of fruit; if the trees were indiscriminately planted in the spots which are marked on the plan..... To obviate such inconvenience, it should be understood to be a fundamental rule, that *each fruit-tree must be provided with a neighbour which is of a different growth.* It will, therefore, be requisite to make such a choice of the various kinds and species of trees, that one of a vigorous growth, with a spreading crown or top, should stand next to another that expands with less luxuriance, and has fewer or lower branches. This arrangement may be the more easily accomplished, as every zealous friend of horticulture will naturally wish to possess, in his collection, at least one, or a few trees, of every valuable kind of fruit. And, in order to facilitate such choice, we have subjoined a *catalogue* of the principal sorts of fruit-trees.

But, though the soil and space for standards, according to our plan be rather sparingly allotted, yet there would remain a considerable piece of ground between them unemployed, for 15 or 20 years, while they are young and growing; hence it will be advisable to plant and train between every two standards in the horizontal rows, a small or dwarf tree, with a limited top or crown; bearing early and abundant fruit, till the stems have attained so large a size, and such spreading branches, as to overshadow and stifle their useful, but diminutive neighbours. Thus, the latter must, according to circumstances, yield the room they occupy, to the former; and, after having amply repaid the trouble of rearing them, and their proportion of ground-rent, they may still, with proper exertion, be transplanted to another situation.

Among all fruit-trees, there are none better calculated for intermediate plantation between standards than the *yellow mirabelle*, and the *golden pippin*. The former is of tolerably quick growth, may be managed and pruned at pleasure, and generally bears fruit in the second year after having been transplanted; its abundant plums are of great value, both for home consumption and for sale, when in a dried state.....The golden pippin maintains the same rank among apple-trees, as the mirabelle among the plum-kind; its growth is moderate; the fruit plentiful and delicious, containing a sharp aromatic juice, and a tender pulp.....it may be preserved longer than six months.

A CATALOGUE OF THE MOST ELIGIBLE KINDS AND VARIETIES OF FRUIT-TREES.

I. *For plantations of table-fruit, only*:

1. The Easter, or *Pasque Apple*, is one of the principal and finest Calvilles: it is large, with high projecting ribs, and of a bee's-wax colour; has a white, tender, juicy, pulp; and emits a very grateful odour, similar to that of roses..... The tree bears abundance of fruit, but does not attain a large size.

2. The *Sarasin*, a valuable winter pear, which ought to decorate every orchard; as it may be preserved a whole year. In shape and size, it resembles the *Bonne Louise*, but generally becomes much larger. Its red colour rises on the south side, when it turns yellow in July acquires a mellow buttery consistence, and is then eatable. This likewise affords an excellent fruit for boiling, drying, and other domestic uses. The tree is tall and vigorous.

3. The *White Winter-Calville*, a well-known apple, much prized on account of its aromatic flavour, like that of strawberries, and its acidulated vinous juice. Being of the larger sort of apples, it is somewhat depressed, smooth, glossy, pale-yellow, surrounded with strong ridges, and sometimes red on the sun-side; it maturates on the floor from December to March..... The tree is fertile, and of a middle size.

4. The *Virgouleuse*, a delicious pear of a pyramidal form, with a deep bloom, and short fleshy stalk. Its peel is whitish-green, and, if ripening on the floor (from December to March) generally acquires a fine yellow tint; its pulp melts in the mouth, yielding a copious aromatic juice.....The tree also grows to a moderate height

5. The *Gravenstein Apple*, a species of the Calville, (obtained from Italy) is an uncommonly fragrant, large, delicious fruit; and, though its pulp be somewhat coarse, the sap is copious and pleasing to the palate; its colour is a deep yellow frequently marked with red on the south side. This apple is equally useful for the table and other purposes of economy; as it not only affords excellent cyder, but also, when dry, a very palatable dish: it may be kept fresh during the greater part of the winter.....The tree is of vigorous growth, and bears abundant fruit.

6. The *Streaked Rose Apple*, (Pomme Rose panache) a very early, and beautiful summer-fruit, of a delicious flavour and taste: it is of a middle size, rather oblong than round; of a fine red colour, mixed with yellow on the shaded side, streaked with a deeper red on the southern aspect, but every where marked with deep yellow dots. Its pulp is of a glossy white tinted with rose-coloured streaks, about the core, and beneath the peal; mellow, and uncommonly mild; the fruit ripens in August... The tree does not attain a large size.

7. The *Russian Ice-Apple*, or Astrakhan Apple (Pomme d'Astrachan; Transparente) is unquestionably the most eligible summer fruit, provided the situation and climate be proper for its growth, that is not under 49° of polar elevation. In such a region, it acquires a saccharine juice, which is so copious, that in an apple weighing 4½ ounces, there will be found

on expression, 3½ ounces of liquor, and one ounce of pulpy fibres. It is one of the most smiling fruits, whitish-yellow, with fine red flaming streaks on the side exposed to the sun; and may be eaten at table, or converted into cyder...There are two varieties of this apple; namely, a larger and a smaller one; but neither of the trees become remarkably tall.

8. The *German-muscadel-pear*, (Muscat Allemand) a noble, large pyramidal fruit, with a small bloom, on a shallow excavation, and rather a long stalk. When ripening on the floor, it acquires a red and yellow tint; its flesh is melting and delicate, full of a spicy, delicious juice, similar to that of muscadel grapes; eatable from March till May.....The tree forms a fine crown, and is exceedingly productive.

9. The *Nut-meg*, or *Mace-rennet*, is a valuable apple of considerable size, more globular than oblong, yellowish green, and somewhat rough, but of a dusky red on the south side. Its flesh is tender, and eats short; contains a large proportion of sweet vinous juice, having a fine aromatic taste; it becomes eatable towards the end of October; and may be preserved in its full flavour for a whole year ....The tree attains a respectable size.

10. The *Trout-pear* is a German autumnal fruit, and possesses the advantages of external beauty, a delicious taste, and unusual fertility. It somewhat resembles the *Butter-pear*, but is more oblong, has a finer yellow ground, and many deep red dots, which stand more closely together on the southern aspect. Its flesh is completely mellow, very aromatic, and may be kept longer than the *Buerre-blanc*....The tree of the Trout-pear presents a bulky stem.

11. The *Lauermann-cherry*, is the largest and most beautiful of the heart-shaped cherries, and has an excellent taste. In shape it resembles the variegated half-ounce-cherry, and frequently surpasses it; the flesh is remarkably white, solid, and of a sweet, agreeable flavour. The stone adheres to the pulp, which ripens in June or July; when the skin on both sides acquires very bright red spots, that are imperceptibly lost in the whitish-yellow part of the centre and the shaded quarter. The tree is of a large and bulky growth.

12. The *Old Royal Cherry*, is also of the first rank; large, dark-red, somewhat heart-shaped, with a long stalk; its flesh is red, soft, and juicy, of a spicy, and very agreeable acid taste; the stone, however, is not heart-shaped; it ripens towards the latter end of June.....The tree is handsome, though not very large; has a close, acid foliage, and is exceedingly productive.

13. The *Victorious Rennet* (Reinette triomphante) an uncommonly fine, large, and well-formed apple; which, on being deposited on the floor, acquires a deep yellow tint, marked with stary points, and frequently brown rough spots, or large warts; its eye represents a regular star; its flesh, beneath the tender skin, is yellow; firm, though delicate; yielding abundance of juice, that possesses a pleasant aromatic flavour; it ripens about Christmas, and may be kept till March.....The tree grows luxuriantly, and becomes of considerable size.

14. The *Ladies' Plum* (Damas

Violet), a highly esteemed, large, fine, oblong fruit, of a deep violet or black colour, and a dusky bloom; its yellow pulp separates from the stone; has a sweet, delicate taste, and is eatable in the middle of August.....Plum-trees, on the whole, are of a moderate growth, and generally slender.

15. The *Winter Queen* (la Reine d'hyver), a very excellent pear, of a middle size, but of different shapes and colours, being sometimes of a golden tint, with grey dots, or a few rusty spots, and sometimes marked with many rust-coloured stains....Those of proper growth are pear-shaped, but most of them have an irregular form, with the eye on one side. The pulp is tolerably mellow, granulated about the core, and of a sweet, delicious flavour; it ripens towards the end of November, and is not easily affected by the winter.....The tree is of a moderate size.

16. The *Doctor's*, or *Cardinal's Cherry*; a large, dark-red, globular fruit, with a long and strong stalk; its pulp is red and soft; the juice agreeably sweet and acid, in equal proportions. The stone has a sharp point, and the fruit ripens about the middle of July.... The tree becomes of a tolerable size: the leaves are large, and have a sub-acid taste.

17. The *Red Borsdorfer* is a variety of the delicious German apple bearing that name, and almost excels the latter, though of a similar size and shape. On one side, this fruit is of a glossy red, and a small part of the other is yellow; dots of the latter colour being dispersed over it, and sometimes also warts. Its flesh is uncommonly white, tender, juicy, and sweet, partaking of the odour of roses. The core is encompassed by a bright-red vein. When stored, this apple ripens about Christmas, at which period the German Borsdorfer begins to decay....The tree of the red kind is one of the largest standards; bears every year abundant fruit; and its vernal blossoms resist the severity of night-frosts.

18. The *Duke of Orleans*, usually called the *Lord's Plum* (Prune de Monsieur), a middle-sized fruit, of a fine violet colour, with a strong bloom; almost globular; somewhat depressed on the top, with a shallow furrow. When the tree enjoys a good soil and situation, its delicate and sweet pulp melts in the mouth. It ripens so early as the end of July; and the stone readily parts with the pulp.

19. The *St. Germain*, a well-known and valuable French winter-pear, often very large; of a pyramidal form, having a thick and dotted green skin; but which, while ripening on the floor, becomes yellow. Its flesh is mellow, frequently granulated about the core, and of a peculiarly delicate taste.

20. The *Royal English Apple:* there are many varieties comprehended under this denomination; but the genuine sort, is an exceedingly large, showy, and valuable fruit, belonging to the family of the Calvilles: it is very bulky below, and tapering towards the top; has strong ribs and other protuberances; and a very short, deeply inserted stalk. The skin is throughout whitish-yellow, shining, and covered with greenish-white, delicate spots. Its flavour is strong, though agreeable; the pulp is white, rather mellow; and

contains a very pleasant juice, of a scent resembling that of roses: the apple is eatable in November, and may be kept till January..... The tree is of the larger kind.

21. The *Altendorf-Cherry*, is a very tender fruit, which, though belonging to the family of the acid glass-cherries with a white sap, has nevertheless a pleasant sweetish pulp: it is bright red, of a flat globular form; has a very short, deeply inserted stalk; and ripens in the beginning of July....The tree bears a thick, acid foliage, and does not attain any considerable size.

22. *Golden Rennet* (Reinnette d'Or) of Du Hamel, a beautiful and excellent apple, the size and shape of which are similar to that of *Borsdorf:* it is of a bright yellow tint, marked on the south side with faint red streaks and yellowish brown dots: its flesh is remarkably tender, and of a glossy white; the juice has the taste and flavour peculiar to pine-apples, and which is also found in the golden pippin: when stored, it ripens in December, but attains to perfection only in February.....The tree has a healthy appearance, and is of a middling size.

23. The *Royal Plum*. (See No. 10 of the west side of the Espalier).

24. The *Gilded Butter-pear* (Beurre dore) is a luscious fruit, nearly related to the white butter-pear, having a similar taste, and ripening about the same time, but generally of a larger size, and possessing a finer coat than the latter; its peel, being glossy and smooth, resembles unpolished gold; is occasionally streaked, and marked with bright-yellow spots. There is no red colour on this pear, but its south side displays greater brightness than the opposite part which has been shaded.

25. The *Red Perdigron*, an excellent plum of the first class, moderately large, roundish, with a strongly marked furrow; beautifully red; covered with many small gold-coloured dots, and a fine bloom. Its bright-yellow flesh is streaked with white veins; perfectly transparent; and yields a sweet delicious juice. Though its skin be somewhat tough, this plum contains no acidity; so that, in a peeled and dry state, it affords prunes not inferior to those of the white Perdrigon, and other varieties. The stone is small and strongly adheres to the pulp: this fruit ripens about the middle of August.

26. The *New-town Pippin*, or New-York Rennet, a noble American apple. [vol. iii. p. 110.]

27. The *Prince's Table-Pear*, or the Long Green Summer-Pear, is one of the most luscious early fruits, uncommonly long-shaped, quite green, having a very mellow pulp, and ripening in August..... The tree makes a tall and respectable figure.

28. The *Autumnal Anise-Rennet* (Venkel-apple, of the Dutch), a fine fruit, generally of the size of a full-grown English Pippin; bluntly pointed towards the bloomy part, or eye; having a very rough grey-yellow peel, strongly marked with whitish dots, and sometimes with warts. Its flesh is remarkably tender, having a palatable sweet juice, and a most grateful aromatic flavour resembling that of aniseed: it ripens about Michaelmas, and some pears are eatable in a fortnight after. But their spicy flavour continues only six or eight

weeks, as it is dissipated about the end of November, when they become mealy. The tree is of low growth, like most of those producing similar fruit.

29. The *Pear-Quince*, though it cannot be classed among the fruit designed for the table, nevertheless deserves a place in every orchard; as it is used for many culinary purposes.

30. The *Easter Bergamot* (Bugi) an exceedingly delicate fruit; very large, round, somewhat thinner towards the stalk; green, marked with small grey spots; yellowish when ripe, and brown-red on its southern exposure: the pulp is uncommonly white, mellow, and without kernels: containing a copious sweet juice, slightly acidulated..... This fruit ripens on the floor in January, and remains sound till March; but it ought to be left on the tree as long as possible, and not to be brought in contact with articles possessing a peculiar smell, which it readily attracts. Its wood is bulky; though the tree, like the Bergamot kinds, in general, attains only a moderate height.

31. The *Orange Cherry*, resembles in taste that of Altendorf, described, No 21; being a compound of sweet and acid juice, in which the former property greatly prevails. It is of a large size, somewhat compressed, with a small excavation, and a middle-sized stalk. On the south side, it is of a bright-red; on the opposite of a reddish-yellow cast; stained in all directions with transparent spots of the last-mentioned shade. During a rainy summer, it frequently becomes uniformly of an orange-colour; and ripens about the middle of July. This valuable tree is fertile; and, though growing vigorously, never attains a considerable size.

32. The *Black Mulberry*. If this useful tree cannot be planted near the house, or in some convenient corner of the yard, it ought not to be omitted in a complete orchard, on account of its agreeable vinous fruit, the juice of which is very palatable; as it gradually ripens, and not only affords a constant supply of berries for eight weeks, but may be converted into an excellent and wholesome wine. The tree seldom exceeds 20 feet in height; and though durable, demands a sheltered situation, because its sap circulates slowly, and at a late period of the spring: it requires but an indifferent, dry soil, and begins to bear fruit in the second year after being transplanted.

33. The *Folg Cherry* is a large, dark-red, and luscious fruit, with a short stalk, and a small acid leaf: it has a sub-acid taste, accompanied with a most grateful sweetness; is very pulpy, and marked with a deep furrow: it attains to maturity about the latter end of June, and continues till the middle of July..... The tree has a noble appearance, and affords vigorous and bulky wood.

With a view to encourage the friends of horticulture, to introduce a greater variety of fruit-trees, chiefly for the supply of the table, we have annexed a list of the principal sorts most approved, and that justly claim the first rank.

APPLES.

1. The *White Italian Rosemary-Apple* (Mela di Rosmarino), a very

beautiful species of the Calville, having no ribs, but a most glossy skin, which resembles the finest virgin wax; is on all sides marked with clear white dots, and on the south, somewhat red; of an oblong figure, and the size of a goose-egg. Its flesh is white as snow, uncommonly tender, and yielding a saccharine juice of a slightly aromatic flavour. Its large pericarpium contains twenty kernels in five cells; the fruit becomes eatable about the middle of November, and remains sound till February. The tree is of low growth.

2. The *Net-formed Rennet* (Reinette filee) is of a moderate size; yellow; intersected with grey meshy lines; and frequently covered with warts: it has a very tender, though firm pulp, an agreeably, sweet juice, with the peculiar rennet-flavour; maturates towards Christmas; and may be preserved till the succeeding summer. The tree exhibits a respectable figure.

3. The *Punctured Rennet* (Reinette piquee), a smooth, reddish-brown apple, approaching to a chesnut-colour, in shape and size resembling the largest Borsdorfer; covered with white punctures, each of which is surrounded with a green edge: its pulp is firm, mellow, and of an excellent vinous flavour; being eatable in February and March. The tree becomes of a tolerably large size.

4. The *Great English Rennet*, a fruit which often attains the size of the *Pound-apple*; has generally flat ribs, and a strong bloom; is of a bright-yellow colour, with many small brown punctures. Its flesh is somewhat mellow, agreeable to the palate, and may be eaten from December to February. The tree is tall, and very productive.

5. The *Norman Apple* (Reinette de Normandie); an excellent fruit, of a middling size, and regular form; when ripe, it is of a golden tint, covered with many grey, angular dots; has a very tender, yet firm, yellow pulp, containing a pungent spicy juice; ripens about the end of February, and may be preserved till Midsummer. The tree is of an inferior size.

6. The *Noble Pippin*, an exquisite fruit for the table: of an oblong shape, tapering toward the eye; smooth, bright yellow, with a few red streaks on the southern side. This apple ripens early, and remains sound till the end of April. The tree, though not growing tall, bears ample fruit, even in those seasons which are unfavourable to the blossoms; it thrives in situations where other orchard-trees will not prosper.

7. The *Spotted Pippin* is one of the most elegant apples, in form and size resembling the largest Borsdorf-kind, having a stalk deeply inserted in a wide excavation; it is of a greenish-yellow cast, marked with numerous grey, often rust-coloured spots, and angular punctures; has a very delicate, though firm, greenish, juicy pulp, possessing a similar aromatic flavour with the English Golden Pippin; and remains sound till May. The tree is of a moderate size.

8. The *Winter Anise-Rennet* (Fennouillet gris), is of a size and shape like that described No. 28; of a grey fawn shade, and sometimes marked with warts; the tender pulp has the peculiar anise flavour. This apple is edible from December till February...The tree is of low growth.

9. The *Late Yellow Rennet* (Rei-

nette jaune tardive); a moderately large, well-formed, and beautiful apple; yellow, but on the south side reddish, with brown punctures; the pulp is mellow, juicy, and of a very agreeable vinous taste; eatable from Christmas till March....The tree, though growing vigorously, attains only a middling height.

10. The *Nell-Gwyn*, an English fruit; uncommonly large, globular, yellow, and occasionally spotted or punctured; its yellowish pulp has a delicious sweetly-acidulated taste, and an exceedingly pleasant flavour; becomes eatable in February and March....The tree is of the largest kind, and is very productive.

11. The *Pear Rennet*, both an autumnal and winter-fruit, presents a capital apple, of a tender yellowish pulp, the juice of which has the acidulous flavour of Rhenish wine; it is sufficiently mellow in the beginning of November, and may be preserved through the greater part of winter....The tree is of slender growth.

12. The *Loskrieg*, or *Princes Table-apple*, a delicious autumnal fruit, vying with the former: it is of the Calville family; moderately large; somewhat oblong; whitish, and on the south side with red streaks....The tree does not rise to a considerable height.

13. The *Reval Pear-apple* is, next to the Russian Ice-apple, the most acceptable summer-fruit, when planted in a favourable soil and situation; as it is a variety of the latter. Though of a small size, and somewhat depressed, it has a sweet, aromatic taste; is of a fine yellow tint, streaked with red, or handsomely flame-coloured. In hot summers, the pulp of this fruit, on the solar side, is converted into a saccharine juice, and acquires the consistence and taste of a delicious apricot: it ripens in August....The tree is of the smaller sort.

PEARS.

a. The *Muscadel-Pear of Metz*, a smooth-round, and very sapid winter-pear; whitish-green, but yellow when ripening on the floor, and red on the south side; having a mellow pulp with an agreeable saccharine juice....The tree is uncommonly fertile; though it becomes only of a moderate size.

b. The *Imperial Pear*, much resembling the *Virgouleuse*, has a tolerably mellow pulp, without stones; a sweetly flavoured juice, and is eatable in April and May. ....The tree grows vigorously, and is easily distinguished by its leaves, the edges of which are curled like the foliage of the oak.

c. The *Winter-Thorn* (Epine d'hyver), in size and shape is similar to many kinds of egg-pears.... Its peel is at first whitish-green, and turns yellow, when ripening on the floor: the pulp is mellow, sweet, and of a delicious aromatic taste. This pear is fit to be eaten in November, and remains sound till the end of January....The tree vegetates with great luxuriance.

d. The *Long Green Winter Pear* is a fine fruit, with a large stalk: its green peel is marked with grey punctures, and the mellow saccharine pulp recommends itself by its strongly aromatic flavour. It is edible from December to February, and may be preserved still longer....The tree makes a handsome figure.

e. The *White Butter Pear*; and

f. The *Grey Butter Pear*, are well known to amateurs, and deserve to stand in every orchard, being excellent autumnal fruits.... The former is also very useful for culinary purposes, even before it attains to maturity by lying on the floor: in a good soil it often forms a very large tree; but the grey butter pear is of a lower growth, though with more expanded branches.

g. The *De-la-Motte*, one of the most luscious autumnal pears; the tender pulp and sweet juice of which, nearly approach to that of the fruit last mentioned. It is generally large, and in a manner tumefied; of a green shade; and thickly sprinkled with large grey spots: it ripens in October and November....The tree is only of moderate growth and height.

h. The *Savoury Pear* (la Savoureuse) is of a similar size and form with the *Virgouleuse;* more oval than pearl-shaped, with a small, smoothly-situated bloom; is covered with a thin peel of a greenish-yellow cast, finely punctured: its pulp has a buttery-pleasant taste, and ripens in November....The tree is of a middling size.

i. The *Radish-Pear*, a very superior summer fruit, the juicy part of which is so rich, refreshing, and agreeably acidulated, that it excels in its kind the grey butter-pear.... But, as it easily becomes mealy, though of a muscadel-flavour, when left to ripen on the tree, it ought to be timely removed, and deposited on the floor....The tree is remarkably fertile, and produces fruit in seasons when almost every other pear-kind has failed: hence it deserves to be reared, even in climates and situations not very favourable to orchards; as it is of vigorous growth, and attains a tolerable size.

k. The *Non-pareil Bergamont*, is a considerably large pear, with a green peel, containing a mellow pulp, of an incomparably aromatic taste: it becomes eatable in October and November....The tree is one of the largest among the Bergamots.

l. The *Egg-Pear:* this well-known and esteemed fruit requires no description; its delicately mellow pulp yields a highly palatable sub-acid juice of a peculiar flavour, and justly claims the preference over many of the French butter-pears.

m. The *Summer Thorn* (Epine d'ete: Fondante musque) is a large delicious pear, of a very penetrating musky scent and taste; oblong, pear-shaped, with a fatty, tender, green skin, marked with whitish dots: its pulp liquefies in the mouth; and the fruit ripens in the beginning of September....The tree is exceedingly fertile, and its dependent pears appear like ropes of onions; on which account the trunk arrives only at a moderate height.

n. The *Green Summer Sugar-Pear*, of Hoyerswerda; an excellent new fruit of a moderate size, and which has taken its origin from the kernel of the Winter-pear *(Sucreverd)* cultivated in Lower Lusatia: it is oblong, but arched toward the bloom; of a grass-green shade; spotted in every direction with green and grey dots: the pulp is mellow, without stones, and surpasses in taste all other summer-pears. Its juice is of a vinous, sub-acid taste, decidedly superior, at least in flavour, to its parent fruit before mentioned. If the Green-Sugar-

pear be suffered to ripen on the tree, it acquires a greenish-yellow shade, and its flavour approaches to that of the French *Muscat Robert*. Its period of maturation is from the middle to the end of August, and it can be preserved only a few weeks after being deposited on the floor. The tree bears fruit every year; its blossoms resist the most unfavourable weather; and the wood remains sound in the severest winters.

o. The *Spicy Muscadel-Pear*, a handsome and delicate fruit, of the smaller kind; being of a roundish form, with a very small depressed bloom, but a long slender stalk; yellow when ripe, and of a bright orange-colour, inclining to red on the southern aspect; marked with greyish-red dots, somewhat rough to the touch. Its pulp eats *short*, and is partly granulated; contains an excellent spicy and saccharine juice, which maturates in July and the beginning of August, but cannot be preserved above eight days, as is the case with the generality of summer-pears. The tree is of a prolific kind, and bears solitary fruit: the wood has a fine grain.

GRAPES.

For a specific account of these inestimable productions of Nature and Art, we refer the reader to the article VINE.

PLANTATIONS OF THE MOST USEFUL FRUIT-TREES IN DOMESTIC ECONOMY.

1. The *Red Stettin*, *Rostock*, or *Iron Apple*, is large, globular, dark-red, sometimes light-green on the shaded side; has a glassy, hard pulp, containing a large proportion of an excellent vinous juice: this fruit is equally regarded at the table till the latter end of August, and serviceable for boiling, baking, and converting it into perry. The tree grows freely, and attains a great size; is not easily injured by unfavourable springs, while in blossom; and possesses other qualities which greatly recommend its culture. The *Green Stettin Apple*, a variety of the preceding sort, also deserves to be reared.

2. The *Reine claude* (See No. 4 on the western side of the Espalier) in the progress of this essay.

3. The *Blessed Pear* (Poire benite: Belle fertile), is thus justly denominated; as it is one of the most plentiful productions of the vegetable kingdom. LEWIS XIV. who was the first encourager of fruit-gardening in France, introduced this admirable plant into his dominions, and intrusted the nurture and propagation of it to the Carthusians, an order of Monks then flourishing at Paris. The French King had judiciously commissioned all his Ambassadors in Europe, to collect and send the most valuable fruit-trees: with which those monastic gardeners, by their extensive nurseries, exercised (till the period of the late Revolution) a most lucrative traffic, and realized several millions of livres annually; but these noble plantations are now in a desolated state. One of the most beneficial plants thus obtained, was the *Blessed Pear*, a yellow fruit, reddish on the south side, with a straight, rather long stalk: in hot summers, it has an agreeable juicy taste, and ripens toward the end of September. Beside their use at the dessert, these pears may be prepared in a variety of forms for culinary dishes.... The tree, when full grown, does not exceed the middling size.

4. The *Seven-sleeper* (Sieben-

schlafer, of the Germans); an autumnal, moderately large, oblong apple; of a golden tint; broad toward the stalk, and somewhat tapering in the direction of the bloom. Its yellowish pulp has a very agreeable, sub-acid taste, and serves every purpose of domestic consumption. The tree is peculiarly valuable, from this circumstance, that its blossoms appear nearly a month later than those of its neighbours: and, though it be thus exempt from the injury often occasioned by severe night-frosts in the spring, yet its fruit generally ripens about the middle of August. Hence, it merits great attention in cold situations, which are exposed to vernal blights.

5. The *Pound-Pear* is an extraordinary large, thick, oblong fruit, of a greenish-grey colour: it is often reared in the vicinity of buildings, to shelter its ponderous fruit from boisterous winds, before it has attained to maturity. Though its pulp be somewhat tough, it is a very useful pear in domestic economy, especially for drying. The tree rises to a considerable height, and spreads its branches; is very productive; and its blossoms are not liable to be injured in the spring. There is a variety generally called the *Small Pound-Pear*, which acquires only half the size of the former, but possesses all its valuable properties.

6. The *Green Rennet*, belongs to the smaller sort of pears; has an uncommonly rough peel, of a grey colour, with a light green shade: its yellowish pulp is firm; streaked with green veins; juicy; and possesses an agreeable rennet-flavour. When laid on the floor, it ripens in January; and may, in a dry cellar, be preserved for a whole year, without becoming insipid. It is a well-tasted fruit, both for the dessert and culinary preparations. The tree is only of a moderate size, but ably withstands the severity of the winter.

7. The *Sweet Winter-Calville*, is a large apple, externally resembling the fruit of the Calville family, with five broad and shallow ribs, but a confined pericarpium, or seed-capsule; it is more oblong than globular; beautifully red, beneath which appears a fine golden tint on the shaded side, and marked in every direction with white spots. Its flesh is faintly yellowish, tolerably firm and good; but, though it have no peculiar aromatic flavour, the fruit serves various economical purposes. In boiling, its slices remain entire, unless reduced to pulp by stirring them; and this pear is peculiarly esteemed for its soundness, which it retains till the second year after gathering. The tree is of a large and durable kind.

8. The *Leofold-Cherry*; a dark-red and excellent fruit, of a very agreeable acidity, and aromatic flavour: it ripens about the middle or latter end of July, and is well calculated for drying....The tree remains of a small size.

9. The *Angober*, one of the most valuable economical pears, on account of its uncommon abundance it resembles the Grey Butter-Pear; is large, of a dusky-yellow, with brownish dots. Its pulp is not without flavour, and peculiarly adapted to the different processes of boiling, drying, &c. It ripens in October and November....The tree exhibits a beautiful figure; having very large, long, broad, dark-green leaves; and its blossoms are not easily scattered.

10. The *Long Carthusian Apple*,

is a capital domestic fruit, frequently of a large size, with irregular angles, and acquires a fine yellow shade on the floor. It may be preserved till the succeeding summer; and maintains the first rank for boiling or baking, in the various dishes of pastry, where it becomes sweetly mellow, and has a delicate taste. When other apples (that of Borsdorf excepted) lose their flavour by culinary preparations, the Long Carthusian is greatly improved by the action of heat....The tree is of an ordinary size.

11. The *Sweet May-Cherry*, (Royalé hative), is moderately large, when perfectly ripe, rather black than dark-red; though it is but two often gathered while red, in order to accommodate the palate at an earlier season: its pulp is soft; the juice sweet, and in favourable, dry seasons, of a highly aromatic flavour; on which account it is, among the sweet cherries, eminently qualified for drying. It ripens about the middle of June....The tree is of the largest kind.

12. The *Red-Cap-Pear* (Kappesbirne, of the Germans), is a most beneficial winter-fruit, and deserves a place in every orchard: it is of a middling size; round, but sharp-pointed towards the stalks; of a brown-red tint on the side exposed to the sun; and yellow on the opposite. Having generally a rough taste, it is not fit to be eaten in a raw state; though in hot summers it becomes partly mellow, and is well tasted. On the other hand, it is an excellent pear for boiling, drying, and particularly, for sauces, or similar purposes; and may be preserved till the ensuing summer....The tree is uncommonly large, and productive. ....The *White-Cap-Pear* is round and quite green: it affords the best perry; but the tree is of a small size.

13. The *Great, Sweet May-Cherry*, has all the good properties of the variety stated, No. 11; but attains a greater height, and ripens somewhat later than that just alluded to.

14. The *White Beard-Pear* is a yellowish-green vinous fruit, rather of a small kind, but which yields a very large proportion of juice, and is therefore excellently calculated for making perry. It grows in clusters, like ropes of onions; and, if left too long on the tree, is apt to become black, and to decay; though still useful for the purpose above-mentioned.....The tree, on account of its remarkable fertility, arrives only at a moderate size.

15. The *Been-Apple*, a very valuable fruit for economical uses, and likewise for the table. It is of the larger kind; bulky at the stalk, and tapering towards the head; of a yellowish-white cast, with red flame-coloured streaks on the south side. Its pulp is white, tender, though firm, and of an agreeable taste; the apple being edible in December, and easily preserved till the next crop. When dried in slices, it affords delicious food; and also a fine dish when boiled in a fresh state....The tree is of a pyramidal form, rises to a considerable height; has a durable wood; does not shed its blossoms: and is very productive, so that it seldom fails of being fertile for a single season.

16. The *Count-Henneberg Cherry*, an excellent sub-acid fruit, of a moderate size; dark-red, with a

long stalk; of a very agreeable taste, whether dry or preserved: it ripens in the latter part of July, or beginning of August...The tree is of low growth, and has dependent branches.

17. The *Summer Christian*, or *Apothecaries-Pear* (Bon Chretien d'ete), is a large tumefied fruit, of a pyramidal form, having a shivery pulp, and a copious sweet juice: it is equally delicious in a fresh state, as well as boiled, dried, and for sauces or syrups in cookery....The tree attains a stupendous size, and is uncommonly fertile.

18. The *White Paradise*, or *Wedding-Apple*, in shape and beauty resembles that of Borsdorf, but in some seasons becomes larger. On its south side, it is beautifully tinted with red, and the other parts resemble in colour, half-bleached wax. Its flesh is of a glossy white; a tolerably good taste, yet without any peculiar flavour. When cut in slices, it is one of the finest apples, both for boiling and drying: nor is it less useful for making perry; in which respect it vies with that of Borsdorf, and imparts to the liquor a more pleasing colour than any other fruit....The tree is of the larger kind, and its spreading branches are extremely productive.

19. The *Blue Egg-Plum*, or *Hungarian-Plum*, is of the size of a hen's egg; has a greenish pulp, containing a copious and sweet juice. It is less calculated for boiling and drying, than for the dessert; as it is in much request, and ripens in August....The tree is one of the most fertile.

20. The *Saranin-Pear* (See No. 2.

21. The *Early Maat-Apple* of the Germans, is large; oblong; streaked with red, but yellow on the shaded side; having a mellow, loose pulp; and affording an excellent juice for cyder....Although the tree be of low growth, it is remarkably prolific, and its wood very compact: the blossoms are not easily shed in unfavourable springs, so that the fruit seldom fails.

22. The *Caraway-Pear* (Besi d'Heri) is of a middling size; almost globular; brown-red on the south side, and greenish-yellow in other parts: while fresh, it supplies the table, and may also be converted to other economical purposes; being a very tender aromatic pear, which ripens in September.....The tree does not exceed a middle size, though it bears abundance of fruit.

23. The *Domestic Plum* is so generally known and cultivated, that it may be considered as one of the most useful fruits; though a single tree will yield but a scanty supply. This species may be easily propagated from the kernel; and those trees which have been improved by engrafting, inoculating, or inarching, produce a large and more delicate fruit, which readily separates from the stone.

24. The *Streaked*, or *Striped Apple*, of the Germans, is a very profitable fruit in domestic economy; of a globular, though compressed form; a moderate size; yellow cast; and marked with red streaks. Its sweet pulp yields a copious juice; it furnishes a palatable dish, whether boiled or dried in slices; and may be advantageously converted into cyder. This apple ripens early, and remains sound till February. The tree attains a very respectable size and age; is one

of the most productive; and its blossoms resist the vernal frosts.

25. The *Spanish Cherry*, a noble fruit for drying, preserving, &c. is of a large size; dark-red tint, approaching to black; flatly compressed below; and having a short stalk. Its juice is of a deep-red dye; of a mild sub-acid, and pleasant taste; it ripens about the middle of July.

26. The *Late Maat-Apple* of the Germans, is a most beneficial fruit both in autumn and winter. Although its blossoms appear several weeks later than those of the former, in consequence of which it is seldom affected by the spring-frosts, yet it ripens, and is eatable at an earlier period, and may be preserved throughout the winter. It is of a considerable size; of a yellow shade with red streaks; its pulp has a fine taste; and it is, on the whole, a very useful apple in domestic life. The tree forms a large, spreading crown, and bears in abundance.

27. The *Egg-Pear* (Bestebirne) a national fruit of the Germans, is not only (see *l.* p. 186) much esteemed at the dessert, but also yields fine perry, or vinegar. The tree is of the productive class, and deserves a place in every orchard.

28. The *Pound-Apple* (Tellerapfel), is likewise a German production, which deserves to be reared both for its uncommonly large size, and the steadiness of its blossoms in unfavourable springs. It ripens on the floor, and becomes unctuous to the touch. Its pulp is partly mellow, and of a fine sub-acid taste. It remains sound from November to February, and frequently till May; being chiefly calculated for boiling, drying, and the making of cyder. The tree exhibits a fine and expanded crown.

29. The *Pear-Quince* (see above No. 29) is a very serviceable fruit to the house-wife; and though, when boiled, it requires a large portion of sugar, yet this expensive article may be supplied by the syrup obtained from pears. Dried in slices, the pear-quince imparts to boiled fruit an agreeable flavour.

30. The *German Fleiner Apple*, is a large, beautiful, glossy, yellow fruit, rather oblong than globular, and ranks in the first class of economical fruit: on the south side, it is tinted with red, and may be regarded as a counter-part of the Been-apple, described No. 15, p. 189. It remains sound till April; and its pulp partakes of a sweet and acid taste; having a strongly aromatic and agreeable flavour..... The tree attains a respectable size.

31. An *improved variety of the Plum*. See No. 23.

32. A *Black Mulberry Tree*..... See above No. 32.

33. The *Brussels Brown Morel*, a dark-red, spherical, acid cherry, containing a richly tinctured juice, of a very pleasant taste. When perfectly ripe, about the latter end of July, it is equally fit to be dried and preserved for use. The tree remains of a small size, like the Morels in general, and has dependent branches; but it is exceedingly fruitful, immediately after the first year of engrafting.

On the most advantageous method of arranging the Espaliers.

An orchard that is encompassed by a wall, or railed with suitable boards, not only affords protection to the fruit, but its value may be

considerably enhanced by the rearing of dwarf-trees. The most profitable and delicious of this description are doubtless the *Peaches*, especially if they be intended for sale in a public market: hence we shall concisely state the principal sorts of such fruit as may be planted with the greatest advantage on the *eastern* and *southern* sides. Early peaches are always more favourably situated in an eastern than in a southern aspect; for, when placed in the former, they are not so liable to be injured by night-frosts as in the latter: on the contrary, late peaches require more solar heat, and will consequently be better adapted to a southern exposure.... *Apricots*, likewise, may be more easily and beneficially raised on the east than on the south side of the garden; because the heat of the sun exsiccates, and renders them mealy; independently of which circumstance, they are in the meridian direction more liable to be injured by night-frosts. The *western* wall will be most usefully formed into espaliers of *Cherry* and *Plum-trees*, as likewise for planting *early Grapes*. Lastly, even the *northern* side is advantageously employed by the skilful gardener, who will, in this situation, endeavour to introduce the best species of hazle-nuts, filberts, &c.

Plantation along the Eastern side of the Wall, or Railment; consisting of early Peaches and Apricots.

If the wall, or other inclosure round the orchard, be from 7 to 8 feet high, the espalier ought to occupy a space of from 12 to 14 feet. In case, however, the wall should be only 6 or 6 ½ feet high, it will be necessary to form the plantation of peaches, at the distance of 18 or 20 from the neighbouring trees.

I. *The following list contains a view of the most valuable and early sorts of Peaches and Apricots, which should adorn the Eastern side of the Wall.*

1. The *Small Naked Early Peach* (Petite Violette-hative) yields a tolerably mellow fruit, of a yellowish shade, but rose-coloured about the kernel; its juice is strongly aromatic, and of a delicious taste. It ripens in the beginning of September, somewhat earlier than the large variety of the same name.

2, and 3. The *Pine-Apple Apricot*, is one of the most savoury; more oblong than round, marked with deep-red spots on the south side, and in other parts of a golden tint. Its pulp is throughout of a reddish-yellow colour, and contains a highly flavoured, palatable juice. It never turns mealy, like the other sorts, and ripens about the middle of August. Its kernel is as sweet as an almond.

4. The *Brussels Apricot* (Abricot de Nancy), is of a considerable size: somewhat oval, being slightly red; and for the most part of a pale yellow shade; its pulp is reddish yellow, and melts in the mouth; the copious juice is of an agreeable taste and flavour. This fruit also attains to perfection in August.

5. The *Large Early Apricot* (Grand Abricot hatif; Abricot commun), a large and beautiful fruit, of a dark-yellow shade, and sometimes red; it has a good juicy

pulp, but no peculiar flavour; and easily turns mealy, after having arrived at the point of maturity. It becomes ripe soon after the small early apricot.

6. The *Large Sugar Apricot* resembles in size and shape the preceding variety; but, when full grown, has a coat somewhat fallow; its pulp is of a golden hue, and remarkably saccharine; it ripens after the early sort last mentioned.

7. The *Early Montague Peach* is of a large and handsome size; of a fine red tint on the side exposed to the sun, and a yellowish cast in other parts; being juicy, sweet, and without any red dye about the kernel, from which it is not readily separated: it ripens about the latter end of August.

8. The *Bell garde* is likewise a very beautiful, large, and excellent peach, with a strong tint of red on a yellow ground, and of a deep-red shade on the south side. Its pulp, though rather firm, yields a sweet juice of an agreeable taste; the fruit is in season together with the preceding kind.

9, and 10. The *Maltese Peach* is highly esteemed by those who prefer a sweet to a vinous taste: it is of a middling size, a spherical form, red-streaked on the south side, and, in other directions yellow; the pulp is white, exceedingly delicate; melts without appearing watery; contains an uncommon proportion of saccharine matter; and has an exquisite flavour. The stone firmly adheres to the flesh, and presents a small point in one of its extremities; the fruit arrives at maturity toward the end of September.

11. The *Red Magdalen* is also a fine, inviting peach; having a white mellow pulp, which is red around the kernel; affords a savoury, sweet juice; and ripens about the middle of September.

12. The *Charlestown*, or *Ananas Peach*, is a new sort, reared in America, from the kernel. Although its colour is inferior to that of most other peaches, being of an uniformly pale yellow, without any red tint, yet its firm and juicy pulp possesses the delicious flavour of the pine-apple: it ripens in the beginning of October.

13. The *Genoese Peach* maintains the first rank; being of a considerable size, and marbled of a bright-red tint on the south side; its dark-yellow pulp is incomparably delicate, resembles in flavour that of the melon; and is of a rose-red hue around the stone; this fruit attains to perfection about Michaelmas, or somewhat later.

14. The *White Magdalen*, a tolerably large, round peach, of a yellowish-white, but of a lively red on the south side: its pulp is mellow, and very grateful to the palate; of a rose-red tint about the stone, and yielding a sweet juice: it is eatable about the middle of September.

II. *Plantation along the South-side of the Orchard, with Peaches of the first rank, but which attain to maturity at a later period.*

1, and 2. The *Maltese Peach*.... See above, No. 9.

3. The *Red Magdalen*.....See No. 11.

4. The *Admirable Peach*, a very large and comely fruit, of an agreeable mixture of colours; its pulp though rather firm, has a delicate taste; contains a sweet, vinous juice, of a fine flavour; and is pale-red near the stone: it becomes

eatable about the middle of September.

5. The *White Magdalen*....See above, No. 14.

6. The *Genoese Peach*....See No. 13.

7. The *Charlestown Ananas Peach*,...See No. 12.

8. The *Small Charlestown Ananas Peach*, agrees in colour and other respects with that of a larger size; and, though of inferior growth, it excels in taste, and partakes more of the Pine-apple flavour.

9. The same Peach of the smaller kind.

10. The same, of the larger sort.

11. The *Genoese Peach*.

12. The *Great, Red, Naked Early Peach*, the top of which is of a very dark-red hue, and the lower part greenish-yellow; its mellow pulp partakes of a yellow tint, but is rose-red around the stone; of an agreeably sweet vinous taste, and excellent flavour; arriving at perfection in the beginning of September.

13. The *Noble Peach* is large, spherical, marbled; of a purple tint; has a luscious taste; is faintly red about the stone; and ripens in September.

14. The *Giant Nectarine* (Pavie monstreuse, ou de Pomponne) is the largest of all the peaches, and a true ornament to the dessert; as it displays a beautiful red tint on a white ground. Its pulp is white, though red in the parts next the stone, and contains a vinous, sweet juice; but requires a favourable summer, a mild autumn, and the warmest situation in the espalier: it is mature in October.

15. The *Chancellor's Peach*, a very large, somewhat oblong fruit, marked with a deep furrow, and a small wart; having a fine skin, beautifully red on the south side: its pulp is delicate, and yields a saccharine juice. It may be eaten in the beginning of September.

16. The *Princess's Peach*, or *Large French Mignonne*, one of the most handsome and delicious fruits, of a dark-red and greenish-yellow cast; having a white, melting, and agreeable pulp; containing a sweetish vinous juice; and being in season about the middle of September.

III. *Plantation along the Western side of the Orchard, for raising Cherries, Plums, and early Grapes.*

1. The *Large Glass-Cherry*, is the most bulky of those early productions, and one of the finest bright-red morels; having a white juice and a short stalk: its pungent taste is accompanied with an agreeable sweetness; and the fruit ripens in the beginning of July.

2. The *Black Perdrigon*, a large oblong plum, of a dark-blue colour mingled with faint yellow, and covered with a strong bloom: its light-yellow pulp is firm, yet delicious to the palate; abounds with a sweet, aromatic juice; and the fruit may be gathered towards the end of August.

3. The *Large Montmorency* is one of the best glass-cherries, flatly compressed below; with a thick, short, and deeply-inserted stalk: the pulp is yellowish, of a delicate taste; yields an agreeably acidulated juice, and is in perfection about the latter part of July.

4. The *Large Green Reine-Claude* (Dauphine), a well-known cherry, that ranks among the finest fruits of the kind; it is in great estima-

tion on account of its copious, mellow, and saccharine juice, which is of a peculiarly delicious taste: this cherry attains to maturity in the beginning of August.

5. The *Black Burgundy Grape* is rather below the middling size, but of a sweet, delicious taste, and begins to ripen about the middle of August.

6. *The White Early Leipzig Grape*, is likewise of a moderate size, and produces very sweet, oblong berries: becomes eatable about the latter end of August, but is much improved by remaining on the vine till towards autumn.

7. *The Black Burgundy Grape.* ....See above, No. 5.

8. The *St. John's Plum*, a very early, blue, round, and valuable fruit.

9. The *Leopold Cherry* is a dark-red morel, with a long stalk, and is highly esteemed: it has an acidulated, savoury juice, of an exceedingly pleasant taste, and ripens in the latter part of July.

10. The *Royal Plum* is of a very large size, and one of the most delicious fruits; having a spherical form, with a thin, long, and deeply-inserted stalk: its skin is of a violet hue, marked with many gold-coloured spots: the yellowish-green pulp abounds with a sweetish juice, slightly acidulated, so as to impart to it an agreeably-pungent taste: its period of maturity is towards the end of August.

11. The *Early Natt*, of the Germans, is an exceedingly luscious and large cherry, produced from the kernel; its bright glossy skin, is of a fine red colour; and the tender pulp yields a sub-acid juice highly grateful to the palate. The tree is uncommonly productive; and the fruit, being one of the earliest in season, ripens in the beginning of June.

12. The *Green* or *White Indian Plum*, is a most grateful production, exceeding in flavour the *Reine-Claude* (No. 4.): and though it be little known at present, this whitish-green fruit merits a place in every orchard.

13. The *Red Early Wanfried-Cherry* is of German origin, and of a large size: its pulp is delicate, though not very tender: and contains a whitish sub-acid juice: this savoury fruit is eatable in the beginning of June: and the tree is of the most fertile kind.

14. The *Black Spanish Early Heart-Cherry*, vies with the most exquisite kinds of that class, and is eminently calculated for espaliers. On account of its early and great fertility, the tree is of an inferior size, but loaded with fruit, the mellow pulp of which has a sub-acid taste, and an excellent flavour.

IV. *Plantation along the North-side of the Orchard: or Espaliers consisting of fruit-bearing Shrubs.*

Although this situation is, on the whole, less favourable to the growth and maturity of fruit, yet every industrious gardener will here also endeavour to cultivate quinces, medlar trees, hazel-nuts, &c. because their productions are subservient to many useful purposes in domestic economy. Such plants, indeed, will not vegetate very luxuriantly, or afford early and luscious ornaments of the dessert; but they may with advantage be employed for culinary dishes, or for supplying the table in a fresh state, at an advanced season.

Among the QUINCES, the German Pear-quince, and that of Portugal, are the two principal varie-

ties: they are of similar shape, and differ only in this circumstance, that the former, when boiled, remains entire; while the latter, being more tender, is dissolved into a pulp.

There are thirteen species of the MEDLAR-TREE; of which only one is indigenous (se Medlar); but among all the foreign sorts, Mr. CHRIST recommends the *Dutch Garden Medlar*, as the only and most eligible one for espaliers.

HAZEL NUTS.

In the enumeration of the following excellent varieties, we have adopted the botanical characters given by BECHSTEIN, both on account of their precision, and the appropriate nomenclature, which Mr. CHRIST has omitted in his Essay.

1. The *Zellar*, or *Pound-Nut* (Avellana fructu rotundo maximo), which bears large round nuts flatly compressed on the top; the shell is brown, streaked with white, and spontaneously opens on the point.

2. The *Common Lambert*, or *Almond-Nut* (Corylus sativa), with a long, thin, pointed, sweet kernel; the shell of which is completely inclosed in the flower-cup.

3. The *Large Lambert*, or *Blood Nut* (Corylus sativa fructu oblongo rubente maximo): the green cover inclosing the young nut is nearly cylindrical, and somewhat edged at the top. While in an unripe state, it is of a reddish cast, and rather downy on the upper part: in some, the kernel has a dark-red; in others, a white skin: they are of a peculiar sweet, and agreeable taste; and ripen about the middle of August.

4. The *Spanish Hazel-Nut* (Corylus Hispanica), which attains the uncommon size of two inches in length, and one in thickness: its thin shell is angular towards the head; always remains white; and is half covered by the flower-cup, It ripens at a later season; and the kernel is less sweet than that of the preceding sort.

5. The *Hazel Nut-Tree* (Corylus arborescens) attains a high, thick stem; and forms a crown at the top: the nuts are disposed in large clusters; they have a nearly globular form, being smoothly compressed above, and somewhat pointed below.

On the most advantageous method of employing the space between the Espaliers, and the Wall, or Railment.

The borders of espaliers require a breadth of $2\frac{1}{2}$ or three feet from the dwarf-trees or shrubs: such soil will, however, not admit of vegetables striking deep roots, or of bushy plants, which rise to a considerable height; as the former would withdraw the nourishment from the roots of fruit-trees; while the latter might obstruct their growth, by intercepting the air, and solar rays. Nevertheless, a variety of useful herbs may be reared on these borders, with a view to supply the dessert, throughout the summer and autumn, with delicious fruit. For this purpose, the *Strawberries* claim the first rank; because they may be cultivated on the four different sides: those exposed to the south will be the earliest; then will follow those growing along the eastern wall; somewhat later such as occupy the western border; and lastly, those

which have a northern aspect; the plants being 12 inches distant from each other. Next, in rank, is the *Raspberry* (*Rubus Idoeus*, L.) which ought properly to stand along the northern border; but, being a luxuriant and spreading shrub, it will with advantage be placed in a distant corner. The principal, and most productive varieties of the latter, are those two, termed the *English Double-bearing Red*, and *White Raspberry*. Beside the shrubs already mentioned, a complete orchard should likewise contain the best sorts of *Currants* and *Gooseberries*, of which we shall here enumerate the most esteemed varieties; having already given an introductory description of both, in their alphabetical order.

CURRANTS.

As these berries, which remain for several weeks on the bushes without decaying, progressively become sweeter and more vinous, we would recommend the culture of the following varieties, as the most valuable:

1. The Large, Red Dutch Currant.
2. The Large, White Dutch Currant.
3. The Large, Flesh-coloured Champagne Currant.

GOOSEBERRIES.

There are numerous sorts of this excellent fruit, which have been raised from the seeds, principally by English gardeners, who at present enumerate not less than 280 varieties: from these we have selected the following 24, which are equally esteemed for their uncommonly large size and exquisite flavour.

Red Gooseberries.

1. *Cheetham's Bright Venus*, is a large berry; smooth, or without hair; beautifully red; and of a delicate taste.
2. *Coe's Hannibal*, a very large, oval, smooth berry.
3. *Down's Cheshire Round*, a pale-red, transparent berry, marked with red spots.
4. *Mason's Hercules*, a very inviting fruit; large; globular; without hair; uncommonly handsome; and very transparent.
5. *Taylor's Red Rose*; also very large; oval; rose-coloured; and hairy.
6. *Victory*; one of the largest gooseberries; oval; hairy; and rose-coloured.
7. *Withington's Princess Royal*; is of a good size; round; hairy; and dark-red.

White Gooseberries.

8. *Chapman's Highland White*; is large; globular; red-spotted on its south side; and covered with a few fine hairs.
9. *Liptrot's Duke of Bedford*; a large, oblong, and smooth berry.
10. *Mill's Champion*; is also large and oblong, but somewhat tapering towards the stalk; having a white and perfectly transparent skin.
11. *Stafford's White Imperial*; a capital, early sort; uncommonly bulky; so that the largest, which are slightly oval, attain the size of a walnut; but the smaller ones are of a round form; having a smooth, tender skin, and ripening about the middle of July.

Green Gooseberries.

12. *Boardman's Green Oak;* is large, globular, and smooth.

13. *Creeping Germes*, a very early, large, globular, berry, though some are oblong; green, with white veins; of a sweeter and agreeable taste.

14. *Fox's Green Goose*, is likewise unusually large; globular; covered with hair; and of an exceedingly fine flavour.

15. *Mill's Langley Green*, vies in size with the two preceding sorts, but is of an oval form: its taste is delicious; and the leaf is distinguished from other varieties by its indented shape.

16. *Johnson's Green Willow*, a moderately large, oblong berry; pointed near the stalk, and round towards the bloom: it is oval, smooth, and streaked with white veins.

17. *Shelmardine's Gently-Green;* a large, oblong, and smooth berry.

Yelow and Amber-coloured.

18. *Bell's Bright Farmer;* a very large, oval, and elegant, early fruit; marked with bright-yellow veins: it is smooth, though a few hairs occasionally appear on the skin.

19. *Blackley's Eclipse;* a large, smooth berry; oval; yellow, with green veins; and of a savoury juice.

20. *Bradshaw's Yellow-top*, is globular; smooth, with a few hairs, and of early growth.

21. *Clayton's Canary;* a large, round, greenish-yellow berry; covered with hairs; and being of a good taste.

22. *Mason's Golden Conqueror;* a large, handsome, bright-yellow berry.

23. *Stanley's Dolphin;* a very early sort; being one of the largest and most esteemed: it is oval, greenish-yellow, and smooth.

24. *Taylor's Nimrod*, is also an early fruit, of an uncommonly large size; globular; without hair; of a dark yellow shade, marked with bright yellow veins: it has a transparent skin, and ripens about the middle of July.

Beside the varieties here specified, we find in a late catalogue, published by an eminent gardener, the following sorts enumerated under the head of *New Gooseberries.*

White: Beeman's White Elephant; and white Lily.

Yellow: Nonsuch; Wigley's Mellon; Golden Lion; and Invincible.

Green: Anthony Triumph; Miss Bold; Nield's Green Gage; Mrs. Ewe; Royal George; and Montgomery.

Red: Black Prince; Black Conqueror; Robin Hood; Stafford's Hedge-hog; General Howe; and Supreme.

For an account of the most eligible and productive species of the RASPBERRY, as well as the STRAWBERRY, we refer the reader to these articles, in the progress of the alphabet.

It will, however, not be superfluous, to remind the friends of gardening in this country, that the preceding arrangement and description of the different standard and dwarf fruit-trees, as well as of the espaliers, shrubbery, and fruit-bearing plants, is the result of experience communicated to the public by a *German Orchardist*..... Hence we think it useful to re-

mark, that though *his* statement, with regard to the nature and rearing of the various fruit-bearing vegetables before detailed, may be perfectly correct; yet the temperature of the British climate, when compared with that of the middle of *Germany*, naturally retards the maturity of all fruits reared in the open air, at least a fortnight, in the counties situated to the west, whether in a southern or northern direction; and from three to four weeks, in the direct northern parts of the kingdom:....on the other hand, the climate in the southern and south-eastern counties of England, may be considered as nearly equal in point of heat, to that of the German provinces bordering on the rivers Rhine and Danube.... This circumstance deserves particular attention; as otherwise, the practical gardener will often be disappointed in the expectation of *early* fruit.

Scions for engrafting or inoculating from most, or all, of the foreign varieties before specified, may be procured either by way of Hamburgh, from the orchardists of that city, or by applying to the gardener who superintends the Electoral Orchard at Herrnhawsen, near Hanover.

With respect to the method of planting the trees:....A wide hole must be dug for each, being sufficiently capacious to receive all the roots freely, so that they may not touch the sides. A single fruit-tree should now be deposited in each hole, one person holding its stem erect, while another breaks the earth in small pieces, and throws it in equally upon the roots; the tree being occasionally shaken, that the mould may lie closely on all the smaller roots and fibres, and the plant be gradually elevated, till the top or crown of the roots is only two or three inches below the common surface of the earth. When the cavity is properly filled, it must be gently pressed with the foot; first on the outside, and then advancing gradually towards the stem, the surface being formed somewhat hollow. Lastly, a few inverted sods, or pieces of turf, must be laid over the whole, so as to form a kind of circular bank, three or four inches high; which will not only support the tree, but at the same time shelter the roots from drying winds, and those droughts that sometimes prevail in hot summers. During these operations, the planters must be particularly attentive, that each tree stand perfectly erect, and be arranged in rows, in the manner above described.

Lastly, the soil beneath and between the fruit-trees, till they arrive at their complete size, should by no means be neglected; as the excellence and maturity of the fruits will in a greater measure depend upon its proper culture..... Hence, no grass or weeds should be suffered to grow under the standards; but the ground ought to be frequently stirred with the spade and hoe, in order that the fertilizing particles of rain, air, dew, snow, &c. may more easily penetrate into the earth, and produce beneficial effects on the roots of fruit-bearing trees and shrubs. Such an expedient not only tends to promote their fertility; but it is likewise one of the most effectual means of preserving them in a sound and healthy state. Independently of these advantages, the soil itself will thus be so much improved, that it may serve for rais-

ing the most abundant crops of vegetable roots, and especially *turnips* and *potatoes*. The former are peculiarly calculated for this purpose; as they do not exhaust the soil in any degree equal to the impoverishing effects of the latter. On the whole, we shall conclude with observing, that the art of gardening has lately been carried to a very high degree of perfection in this country, [England] which may justly boast of the most intelligent and skilful orchardists. We think it our duty to mention the title of the following practical and useful work, though we have not had an opportunity of examining its contents: "*A Plan of an Orchard:* exhibiting, at one view, a select quantity of Trees sufficient for planting an Acre and a Half of Land, properly arranged according to their usual size of growth and hardiness of bearing: in which is comprised, a Collection of the most esteemed *Orchard Fruit*, proper for the Table and the Kitchen, in regular succession throughout the season: shewing also, in a distinct *Table*, others nearly similar in quality, size, use, and time of maturity; with an *Alphabetical List* of above *Eight Hundred* Species and Varieties, such as are now cultivated in England; together with the different names by which they are generally known. By GEORGE LINDLEY." (Fol. 2s. Lond. Champant and Whitrow, 1756.) The *Monthly Reviewers* observe, that "this is a pretty present to the young orchardist; and the alphabetical list of fruit-trees may be found useful to the more experienced. Difficulty will always be a spur to ingenuity:.....gardening, therefore, is studied in Scotland, and orcharding in Norfolk." [To the above may be added, BUCKNELL'S *Orchardist*, London.

For further information repecting fruit-trees, the reader is referred to the different articles, and to APPLES, BLIGHT, FRUIT, MOSS, NURSERY, PLANT-LOUSE, PRUNING.]

ORCHIS, or *Orchis*, L. a genus of plants, comprising sixty-five species, nine of which are indigenous; and the most remarkable of these are:

1. The *mascula*, EARLY ORCHIES, or MALE FOOL-STONES, growing in meadows and pastures; flowering in the month of May.... According to an account inserted in the 59th vol. of the "*Philosophical Transactions*," Mr. MOULT maintains, that from the roots of this species is prepared the celebrated *Salep-powder*, which has been highly recommended in cases of consumption (see vol. ii. p. 179) bilious dysenteries, stranguary, and disorders of the chest....The roots should be gathered when the seed is formed, and the stalk is about to decay; for the new bulb (of which *salep* is prepared) has then attained its full size. After separating the new roots from the stalk, washing them in water, and removing the exterior thin skin, they are placed on a tin plate in an oven, previously heated to the degree requisite for baking bread. Thus, in about ten minutes, they will acquire the transparency of horn, without being diminished in size: next, they should be spread out in another room, where they will dry and harden in a few days: or the same object may be effected in a very moderate heat, within a few hours.

2. The *morio*, MEADOW ORCHIS, or FEMALE FOOL-STONES, grows on moist meadows and pastures; flowers in May and June.... The roots are roundish; the stalk is about a foot high; and the leaves have the shape of lancets. This species deserves to be mentioned here, on the authority of BECHSTEIN, who observes, that it is considered as possessing, and even surpassing, the virtues of the foreign salep-root; and, though some naturalists have been of opinion, that the *Early Orchis* is the genuine root imported from Persia, yet we would recommend the culture of the meadow orchis.

Either of these species may be propagated by their roots; which, as the seeds do not vegetate, must be planted in summer, about three inches deep, in a dry soil; where they should remain undisturbed for several years, because they will flourish in proportion to the length of time they have been suffered to grow in the same place....If, at any future period, this excellent vegetable should be introduced into general use, by the patriotic efforts of enlightened agriculturalists, its roots will furnish a cheap, wholesome, and most nutritious substitute for many foreign drugs, such as Sago, Tapioca, Arrow-root, &c. ....See also SALEP.

[ORGEAT. A very agreeable syrup, which when diluted with water, forms an excellent drink in summer. The following receipt to make this syrup, is translated from a late French publication entitled "*Cuisinier Burgeois.*"

To half a pound of sweet almonds, add half an ounce of bitter almonds; put them into boiling water, when the skin comes off easily, take them out, and as they are skinned, throw them into cold water, then drain and beat them in a [marble] mortar, adding occasionally half a table-spoonful of luke-warm water, to prevent their turning to oil; simmer over hot ashes for 3 hours, and filter through an open cloth, pressing the emulsion with a wooden ladle; boil a pound of loaf-sugar, as in the case of *Capillaire*, and finish in the same manner on hot ashes.]

ORNITHOLOGY, is that science which treats of birds; describing their form, animal economy, and various uses.

Although birds are, by their peculiar form, distinguished from all other creatures, yet their *internal structure*, in many respects coincides with that of mammillary animals. Thus, both have a heart with two ventricles and two auricles; red, warm blood; and solid bones; but which, in the former, are almost uniformly hollow, and contain no marrow. Through these concave bones, the air communicates with the lungs, that are grown together with the back and the ribs; being connected with different cellular webs, which serve as reservoirs of air....The flesh of birds also resembles that of the mammillary tribe; but the urine of the former, though secreted in the kidnies, is evacuated by the same canal thro' which their excrements are discharged: nor is their bile collected in a peculiar gall-bladder; for it is, in most instances, conveyed from the liver directly to the intestines.

The stomach of birds is either furnished with a hard membrane for grinding their food; which is the case with all such as subsist on grain; or, it has the power of dissolving their aliment, by the gastric liquor secreted in all carnivo-

rous birds, being similar to that found in the digestive organs of men and quadrupeds; but the former possess the advantage of spontaneously vomiting hair, feathers, and other indigestible matters.

The instinct displayed by every species of birds, in constructing permanent and artificial nests, in the most appropriate spots, deserves the admiration of contemplative minds; though such proofs of providential care, and wisdom, are often regarded with indifference: this extraordinary effort to propagate their species in the most convenient manner, is the more remarkable, as almost every genus of these creatures build habitations of a peculiar form, and with the most proper materials. Another diversity prevails in the shape, colour, and number of their eggs; the deficiency of which the female supplies, in case one or more have been robbed from her nest. Nor is the migratory instinct of many birds, in autumn, less surprising; for at the approach of winter, they often retire to more genial climes, in order to avoid the hardships arising from cold weather and want of food; both being removed on their return in the spring. This wonderful propensity is evident, even in those creatures which are confined in cages; and which, at that season evince an unusual degree of anxiety and turbulence, in their captive state.

Lastly, it deserves to be noticed, that all birds are once, and many kinds of them twice, annually, subject to a change of their feathers, which is commonly termed the *moulting season*. At this period, birds appear diseased, or in a state similar to that proceeding from the obstructed oleaginous gland, which is situated above their fundament; and which secretes an oily fluid designed to lubricate their downy coat; thus enabling them to resist moisture.

Without these charming warblers, the most beautiful and fertile regions of the earth would exhibit a silent, and often dismal scenery. How much, therefore, are mankind indebted to these airy companions of their journey through life !..... Male birds greatly surpass the females in beauty, song, and size; excepting in those of prey; where, in general, the contrary prevails. Many species of the winged tribe are so remarkably docile, as to imitate human speech, and to learn melodious tunes. But, independently of the pleasure thence derived, they are farther of material service to the inhabitants of a country, more especially in hot climates, by destroying myriads of insects, and devouring carcases; which would otherwise prove an intolerable nuisance. The occasional mischief and damage committed by some kinds of birds, on the fruits of fields and gardens, is amply counterbalanced by their extensive services in general. Hence, numerous species which furnish us, either with their palatable flesh and eggs, or with their useful feathers, have been gradually domesticated, so as to become the inmates of our habitations; and particularly those which recommend themselves, either by their beautiful plumage, or by the sweetness of their harmonious strains.

In order to afford a view of the principal kinds belonging to this interesting class of animals, we have been induced to present the reader with the following arrangement:

I. *Domestic and Tame Birds*:... Cock and Hen; Turkey; Goose; Duck; Swan; Pigeon; Peacock; Pheasant; Guinea-hen, &c.

II. *Wild, useful Birds*:.....Bustard; Woodcock; Grouse; Heathcock; Partridge; Quail; Lark; Throstle; Ortolan; Starling, &c.

III. *Singing Birds*:.....Nightingale; Hedge-sparrow; Red-breast; White and Yellow Wagtail; Wren; Gold-crested Wren; Canary-bird; Greater Red-pole; Chaffinch and Brambling; Goldfinch; Siskin; Fly-catcher; Bullfinch; Greenfinch; Titmouse; Swallow, &c.

IV. *Marshy and Aquatic Birds*: ....Crane; Stork; Grey Heron; Bittern; Gull; King-fisher; Snipe; Lapwing; Water-hen, &c.

V. *Birds of prey*:...Eagle; Falcon; Owl; Butcher-bird; Raven; Crow; Jack-daw; Magpie; Nutcracker; Garrulous Roller; Woodpecker; Bee-eater; Haw-finch; Oriole or Cherry-bird; Sparrow, &c.

ORPIMENT, a bituminous mineral, consisting of arsenic and sulphur, often found native in the earth, though it may also be artificially prepared.

This ore has also lately been discovered in the county of Cornwall, whence a specimen was sent to Dr. Hill, under the name of *red mundic*. It is both red and yellow; and, when refined by distillation, forms the colour known by the name of *King's Yellow*.

Orpiment has, by some, been supposed to be harmless, on account of the large proportion of sulphur which it contains; but, according to Macquer, it is productive of the most fatal consequences, and ought not to be used without the greatest caution. Instances having occurred of its noxious properties, it may be ascertained by the following symptoms, whether any person has actually swallowed this drug: Shuddering, anxiety, tremor, violent nausea, and vomiting; an ardent sensation in the throat; fever; thirst; suppression of urine; costiveness; gnawing pain in the intestines; the face swells; while torpor and stupefaction close the scene.

Remedies: As soon as it is obvious that orpiment has been swallowed, the patient (if he be an adult) should drink a tea-cupful of a lukewarm solution of soap in pure water; or, with equal effect, strong solutions of honey; and repeat these draughts according to circumstances. If the former has been used, it will be advisable to take a piece of sugar in the mouth, to overpower its very disgusting taste. Considerable benefit has, likewise, been derived from immediate emetics, or vomiting, excited by stimulating the throat with a feather. At the same time, it will be necessary to apply to the abdomen, cloths dipped in a solution of soap in soft water, with a view to alleviate the pains in the intestines. ....Clysters of milk and oil, and tepid bathing in diluted soap-water, have also been found very serviceable, in restoring the patient to some degree of animation.

ORPINE, the Common, or Orpine-Stonecrop, *Sedum Telephium*, L. an indigenous perennial plant, growing on pastures and in hedges; flowering in the month of August.

This luxuriant herb may be easily propagated either by parting the roots; or by slips, or cuttings of the stalks, in summer; it thrives well in dry soils, being of succulent growth; and spreads rapidly

into tufted branches; when cultivated in gardens, on account of its variegated appearance....A decoction of the leaves in milk, operates as a diuretic, and has occasionally been administered, with success, as a cure for the piles....Cows, goats, sheep, and swine, eat this plant, but it is wholly refused by horses.

ORTOLAN, or *Emberiza hortulana*, L. a delicate exotic bird, inhabiting France, Italy, and the southern parts of Europe; though it also visits Germany, Sweden, and Britain, in which countries these birds are caught during their migration. They feed principally on panick-grass, and grow very fat, especially when fed with oats and millet; and confined in dark cages.

The greatest traffic with ortolans is carried on by the inhabitants of the Island of Cyprus, where they are caught in great numbers, and pickled in casks; each containing from 3 to 400 birds, prepared in spice and vinegar; after having cut off their heads and lower extremities. In this state, they are imported into England, France, and Holland, for the table of the epicure, who pays a high price for these delicious morsels, on account of their exquisite flavour.....FUNKE informs us, that, in productive years, 400 such casks, or, upon an average, 140,000 of these charming warblers, are sacrificed to the palate of man, in the small island above-mentioned.

OSIER, or *Salix viminalis*, L. an indigenous plant, growing in woods, and hedges, especially on boggy land: it flowers in the months of April and May.

This shrub is very valuable; as its leaves are eaten by horses, cows, sheep, and goats; its pliant twigs are woven into *putcheons; wheels* for taking eels: and into bird-cages; the branches are much used for making hoops, and large baskets. Farther, it forms a hardy and useful hedge for excluding boisterous winds; and, as it flourishes in wet situations, is frequently planted, with a view to prevent the banks of rivers from being washed away by the force of the current.

On account of these valuable properties, osiers have deservedly become an object of public attention; and, in consequence of the liberal premiums offered by the Society for the Encouragement of Art, &c. we are enabled to specify such of the numerous varieties as deserve to be preferably cultivated.

Osiers are divided into two classes: the first is known by their more blunt, and downy or mealy leaves; which, in the other, are more pointed, smooth, and green, resembling those of the myrtle.

The *first* class contains, according to the statement of Mr. PHILLIPS (*Transactions of the Society*, &c. vol. 16), nine or ten varieties, the best of which is denominated the *Grey* or *Brindled Osier*. It varies from the others only in its bark being streaked with a red or blood-colour. The grey osier thrives vigorously on fenny lands; is very hardy and tough; and, having a white glossy surface, is peculiarly adapted for cradles, and the finer kinds of basket-work. The other varieties of this class vegetate in the dampest soils, and flourish even on the most barren kinds of peat; but, being coarse, brittle, and decaying speedily, they will not answer the expence of planting, unless in the vicinity of navigable canals: besides, they are fit only for

the coarsest baskets and hampers; and will not pay the expence of land-carriage.

To the *second* class belong:

1. The *Welsh* Osier, which is both red and white, and was originally cultivated in Wales. It forms an useful part of a plantation; being well calculated for tying the bunches or bundles after the rods have been peeled and bleached. Nor is it less serviceable for binding bundles or sheaves of reeds for thatching; though it is extremely bitter, and refused by every kind of cattle, unless the animals are compelled to eat it from hunger. The Welch osiers are very pliant and tough; and, if they could be perfectly bleached, would not be inferior to the best sorts, for manufacturing baskets. Rats have a particular aversion to this variety; and, though every other species of bandage be subject to their devastations, they never touch those bundles which are tied with Welch osiers: the application of this practical fact, to the purpose of expelling those depredators from granaries, deserves the attention of farmers and corn-dealers.

2. The *West Country Spaniard* is thus denominated; because it was first introduced into the western counties of England, from Spain. This variety flourishes in every soil, and attains a considerable size; its bark being of a blueish-grey colour. Although it does not thrive so luxuriantly as the Welch osiers, yet Mr. Phillips deems it worthy of cultivation; having ascertained by experience, that one acre of land will more fitly contain 14,000 plants of the Spanish kind, than 12,000 of the next following.

3. The *New Kind*, is a variety generally known and cultivated. It is divided into two sorts, viz. the *best*, and the *inferior* new kind; the bark of the former is of a light-brown shade, while that of the latter resembles rusty iron, having light longitudinal streaks, whence it has received the appellation of *Corderoy*. This variety flourishes on *mellow* land: on account of its luxuriant vegetation, it requires considerable space to receive nourishment, and the influence of the sun; so that the number planted seldom exceeds 11,000 per acre.

4. The *French Osier* is the most valuable of the numerous varieties. It is preferred to every other, for making the smallest and finest baskets, hats, fans, and other light articles: for which purposes considerable quantities were imported a few years since from France, Holland, and Flanders; because the manufacturers could thus obtain them at a cheaper rate, than if they had been planted in England. The French osiers are of slower growth, than any other sort of this shrub: hence planters are not inclined to cultivate them; as the small profits are inadequate to the ground-rent and price of labour in England. This variety, nevertheless, deserves to be reared; for it is extremely pliable, tough, taper, *close-grained*, and durable: though it be less profitable to the cultivator, it is certain of meeting with a more ready sale. Besides, considerable sums of money, which must otherwise be carried out of the country, would thus be annually saved to the nation, and employment might be furnished to numerous indigent families.

Osiers are propagated by planting *slips* or *foot-sets* in wet or marshy situations: they should be

put in the ground shortly after Christmas; because the plants will be less liable to fail, than if the setting were deferred till the end of April, or the commencement of May. When the soil is sufficiently dry, it will be advisable to scatter a small quantity of cole-seed, or with more advantage, turnip-seed, that will serve as a shelter to the young plants; but either of which ought to be grazed with sheep about Michaelmas; because it will then grow so large as almost to choak the osiers. In the course of three or four years, they will have attained a size sufficient to be cut, and formed into bunches or bundles, by compressing them in an iron hoop of one ell in circumference: eighty of such bundles constitute a load, the price of which varies from 12 to 14*l*. The best soil usually produces *one load per acre*; but, on an indifferent or poor ground, half a load is computed to be a tolerably good crop. The rent of the land, upon an average, is from 20 to 25*s*. per acre; and the expence of weeding, renewing, cutting, and peeling, such a plantation, is estimated at about 5*l*. if the work be well executed. Some careless cultivators, however, suffer the ground to be over-run with weeds, in consequence of which the value of the crop is necessarily diminished.

OSMUND ROYAL, Flowering Fern, or Royal Moonwort; *Osmunda regalis*, L. an indigenous plant, growing in watery places and boggy marshes; bearing flowers in the months of July and August.

It is remarkable, that impressions of the leaves of this vegetable are frequently met with in the nodules, or small masses of iron-stone found in the mines at Coalbrook Dale. The root of the Osmund Royal, boiled in water, affords a thick mucilage, which, in the North of Europe, is employed as a substitute for starch, to stiffen linen. On account of its viscid, sub-astringent nature, it was formerly often used in the gout, as well as in the rickets. It appears, however, to be better calculated for external applications, in contusions and bruises, of which, it is said, to be a powerful discutient:....as it smoothens and softens the skin, it makes a tolerable cosmetic: and is reputed for its property of dispersing freckles, and other pimples from the face.

OVEN, a kind of domestic furnace, used for baking bread, pies, tarts, &c.

Ovens are generally constructed of brick-work in a semi-circular form, with a very low roof, and the bottom of which is laid with stone: in the front is a small aperture and door, by the shutting of which, the heat is confined while the bread is baking. They are usually heated by means of dry faggots, wood, &c. As these ovens, however, are not calculated for small families, on account of the quantity of fuel they consume, others have been contrived, on a more diminutive scale: these are usually formed of cast or hammered iron, and may be heated by the same fire which serves for the cooking of other provisions.

Among the ovens of this construction, that of Mr. Powers, who obtained for it a patent in 1801, deserves to be noticed. It is formed of iron, so as to be portable, and may be conveniently

conveyed to any distance, at the option of its possessor; but, as the reader cannot form a distinct idea of this contrivance, without the aid of an engraving, we refer him to the 14th vol. of the *Repertory of Arts*, &c. where the patent is described, and illustrated with a plate.

In the year 1800, the Society for the Encouragement of Arts, &c. conferred a bounty of 15 guineas on Mr. S. HOLMES, for his invention of an oven, which is heated without flues. The whole consists of a cast-iron oven, from the side of which a solid piece of that metal projects into the fire, where it constantly remains; and, on becoming red-hot, communicates to the whole oven a degree of heat sufficient for baking bread, while it at the same time assists the fire in roasting meat.

In the common iron ovens, the heat is communicated by means of flues, which waste a considerable part of the fire in its passage, and likewise requires much labour to keep them of an uniform heat. The contrivance last alluded to, is intended to supply this and other inconveniences: and Mr. HOLMES state, that his oven uniformly remains at a baking heat, without any additional expence, or trouble. We understand, however, that such improvement is by no means *new*; and that a similar method of saving fuel, has for several years been practisedin the West of England.

[The following cut represents Mr. HOLMES'oven.

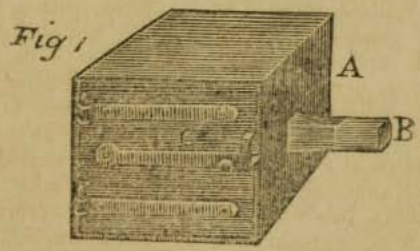


Fig. 1. Is a perspective view of the oven.

Fig. 2. A horizontal section of the same.

A. That side of the oven which is placed next the fire.

B. The projecting piece of iron which remains stationary in the fire, and communicates heat to the oven.

C. The door of the oven. It is 13½ inches wide at the door or in *front*, and 15 inches deep.

It will be evident that Mr. Holmes's, oven is calculated exclusively for a coal fire, in which it would certainly answer a valuable purpose....See Article Roasting Oven.]

OVER-REACH, in farriery, signifies a wound upon the coronet towards the back part of the foot, or heel of a horse: it is occasioned solely by striking the sinew of the fore-heel with the toe of the hind-shoe on the same side; in consequence of which the animal halts, or walks lame....See Halting.

Young horses are very apt to cut their heels when travelling; as their hind-foot moves in the same direction with the fore-foot; and as they are generally too spirited in their first excursions.

Although an *over-reach* is a wound of the complicated kind, yet it is not attended with danger, provided proper application be made, to induce a suppuration. For this purpose, the most efficacious external application will be a proper poultice:....take oatmeal, or coarse wheaten flower; digestive ointment (prepared of equal parts of common turpentine and hog's-lard), two ounces; beer-grounds a sufficient quantity. This may be repeated at least twice in twenty-four hours, till the wound be well digested, smooth, and free from cavaties, or excresences of proud flesh. Next, the surface of the bruised part should be sprinkled over with the following mild escharotic powder:.....Take of burnt lime-stone slaked in the open air, three ounces: and Armenian bole, one ounce: triturate these ingredients in a mortar, and pass them through a fine sieve. ....After sprinkling the wound with this powder, a pledget of dry lint may be laid gently over it; and, when the surface of the contusion is nearly equal with the skin, the powder alone will be sufficient effect a cure.

Ounce. See Weight.

OWL, the Common, or *Strix flammea*, L. a well-known British bird, the elegant plumage and other good qualities of which amply compensate for the ugliness of its form.

This species of the owl may be considered almost a domestic bird: it inhabits, during the greater part of the year, barns, hay-lofts, and other out-houses; where it is as useful as the congenial cat, for clearing those places from predatory vermin, especially mice. Towards twilight, this bird quits its perch, takes a regular circuit round the adjacent fields in quest of prey, and speedily returns to its usual abode. It may be easily distinguished by a hooting and snoring noise; but, when on the wing, it utters the most frightful screams. From the peculiar structure of their eyes, owls enjoy a very distinct vision in the dawn, or evening; though, in a dark night, they can see no more than other animals.

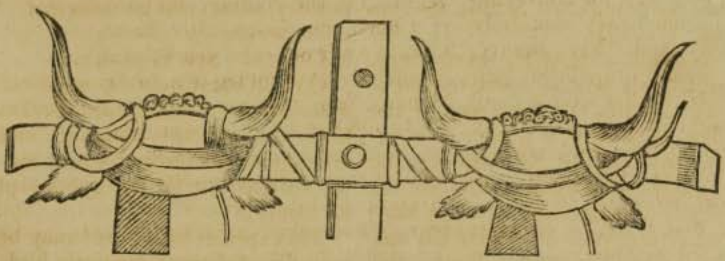
As the young of these birds keep their nest for a considerable time,

and are fed long after they can fly, hundreds of mice become necessary for supplying them with food. *Hence, their breed ought, by every possible means, to be encouraged.* Besides, they may be employed with great advantage for decoying other birds, particularly crows, that are easily attracted by the uncommon figures of the owl, the beak and legs of which are singularly covered with downy feathers.

OX, a general appellation for male black-cattle; but which strictly denotes a castrated bull.

The principle of draught depends, as Lord SOMERVILLE has justly observed, on the joint power of the neck and base of the horn. This object is effected in *Portugal*, by a long leather strap, which is wrapped round the yoke; thence round the lower part of the horns; and is again fastened to the yoke. Thus, the heads of oxen become more steady in performing their work, and the animals themselves are rendered more tractable.

Another mode of working oxen is that termed, *by the head*, which is practised in *France*, and represented in the following cut:



To afford a more complete idea of the manner, in which the French oxen are fastened to the bow, we have added an accurate *front-view* of the upper part of the animals' heads; as such method, in the opinion of Lord SOMERVILLE, is the best preparatory step towards introducing that practised in Portugal.

This method was a few years since introduced into Ireland, by Lord SHANNON, with complete success; two oxen thus harnessed, being able to draw with great ease *three tons* in weight.

The most valuable breeds of these animals for draught, in this country, are those of Sussex, Devon, Herefordshire, Glamorgan, and Pembrokeshire; which, on account of their large size, are well calculated for labour, and justly preferred in those counties, to cart-horses. The Sussex oxen have *beaten* horses at plough, in the deepest clays; and those of Herefordshire are reputed to be superior in long journies, for conveying chalk, or similar heavy materials, over a hilly and flinty country. Although some prejudiced persons may object that oxen are unfit for draught in mountainous situations, yet let it be remembered, as Mr. COMBER pertinently remarks (*Real Improvements in agriculture*, &c. 8vo, 1772, 1s. 6d.) that in such instances, "no *draught* can be *well* used;" and that the descending of steep hills is in all respects as hurtful to horses as to oxen....The Devonshire cattle walk with uncommon speed; and, if four or five horses can till 100 acres of land, the same work might doubtless be managed equally well by a similar number of the Devonshire or Herefordshire breeds, if they were trained and fed (particularly with a view to *speed*) with the same care as horses: the farmer would also save a considerable part of the expence in their food. For though, after being very hardly worked, they require a little corn, yet their *keep*, in all other respects, is much cheaper (see vol. 3. p. 315); and, if *well shod*, they will perform every kind of draught in the same manner as horses: lastly, they will *pay for their labour*; and, after being moderately worked, for 10 or 12 years, if properly managed, they will leave all the profit of their growth, in *clear gain* to their owners. Besides, should an ox, from any unforseen accident, be lamed, or become blind or old, he may be fattened, and sold at any time for a larger price than he originally cost; because these animals uniformly feed in a more *kindly* manner, and sooner grow fat, after they have been worked for several years....On the contrary, the value of a horse decreases, after he attains the age of seven years; and, should any accident happen, he becomes utterly useless.

[In addition to the observations on the comparative superiority, or relative merit of oxen and horses; given in vol. 3d. p. 315; it may be here stated, that it is absolutely impossible, to give either animal the entire preference over the other, for every kind of business on a farm. There are some cases in which oxen certainly do as well as horses, in others they do better; in both these instances therefore the use of the horse is an unnecessary expence; thus, wherever oxen can be used for draught, as in hawling manure, stones, rails, timber, grain, to or from the mill, oxen are on every account, speed excepted, on a par with horses; and even as to speed, care in breeding, in selecting the quick travellers, and in training them to a quick step, might be so well bestowed, as to render that advantage a doubtful one; nay, from some trials it would seem that the advantage as to

speed, is on the side of the oxen. "A team of five oxen, and a team of four horses, went 14 miles twice a week, with a load of two tons.... The oxen were generally at home two hours before the horses. Another person who drew with oxen, two or three years, and made fair experiments with them and horses, says, an ox valued at 30 dollars, is equally strong in draught, with a horse valued at 90 dollars, and equally fit for ploughing, or cart: that the ox requires a fourth part less provender than the horse; and lastly, that an ox works and increases, from four till ten years old; but that seven hours work a day is to him as much as eight to a horse." *Young's Eastern Tour*, vol. 1. p. 172. In order to call forth their exertions, oxen must be gently driven, and with *good temper*, without hurrying; it is owing to the foolish practice of trotting along the road, with a horse team, that our farmers have learned to despise the regular pace of the patient steady ox.

Mr. BORDLEY makes the following comparison of the expence and value of a horse and ox.

An ox costs	$ 40	
An ox 3 years keep $ 24	72	
An ox 1 year, and fattening	40	
He gains from 4 years but partial work		$ 160
Gains from 4 years *manure*		40
Sold for		80
	152	280

The absurd mode generally followed of yoking oxen, is one cause of their slow pace: and yet farmers without reflecting upon the awkwardness of the position in which oxen draw, when their heads and necks are unnaturally pressed far below the line of their backs, continue to use the yoke because their *fathers* did, thus loosing full one half the beasts' power. Mr. COOPER (*Young's Eastern Tour*) uses collars as on horses, except that they are buckled on with the narrow end open and downward: the chains are fastened to them in the same direction as on a horse harness, the draught is therefore more inclined than with horses, the line of the chains being almost up to their backs; which is necessary from the different shape of horses and oxen; (this line we shall prove, when we treat on WHEEL CARRIAGES, to yield the most power.) They draw when in harness, abreast, in pairs; single or in a line, and walk as fast as horses. Mr. BORDLEY says "he saw a waggon in Pennsylvania, drawn by two bulls and two oxen, bridled and geered in harness and collars; and in Maryland, he saw a woman going to a race with her chest of cakes, and sitting in a truck drawn by a bull bridled and guided by herself; and that in the same, state, one SUTTON SICKLEMORE, rode a bull about the country."

There are some cases in which horses are without doubt much preferable to oxen, as in harrowing. The faster the harrow goes over the ground, the better; as a quick stroke against the clods, breaks them much easier than a slower motion; hence Mr. L'HOMMEDIEU of New-York observes, that harrowing with horses, is to be preferred to harrowing with oxen, because they move quicker: with a

light harrow, the horses may go on a trot. This he has seen done to good purpose.

Mr. KENT, who has the charge of the farm of the king of Great Britain, at Windsor, says "he has found oxen to answer so well, that now, not one horse is kept on the farm. The working oxen are mostly divided into teams of six, and one of the number is every day rested, so that no ox works more than five days out of seven. This day of ease in every week, beside Sunday, is of great advantage to the animal, as he is found to do better with ordinary food and moderate labour, than he would do with high feed, and harder labour. This is the first secret to learn concerning him; for an ox will not admit of being kept in condition, like a horse, artificially, by proportioning food to labour..... These oxen are never allowed any corn (oats) as it would prevent their fateningso kindly afterwards. Their food in summer is only a few vetches (peas) by way of bait, and the run of coarse meadows, or what is called leasows, being rough, woody pastures. In winter, cut food, two thirds hay and one third straw, 24lb. hay and 12 of straw in 24 hours. They are fed in open sheds, but not confined. The result of the ox system is 20 per cent. profit on each ox. They are all worked with *collars*, as their step is more free than when yoked."

To *train oxen*, *Mr. K. directs* to put a broad strap round their necks; fasten one end of a cord to it, and the other end to a large log of wood; permit the ox to drag it about as he feeds in his pasture, for three or four days before he is put into harness, by which his docility is much forwarded. *Transactions of the Society of Arts*, 1800.

To *know the age of an ox*. In addition to the directions given in vol. 1. p. 438, Mr. DEANE "New-England farmer," "says, when an ox is four years old, he has one circular ring at the root of the horns; at five, two rings; and one ring is added each year; so that if you would know the age of an ox, count the rings on one of his horns, and add three, which amounts to the true number of his years. It is the same in a bull or cow."]

Oxen, then, being of extensive and permanent utility, deservedly claim every attention from the humane and unbiassed husbandman, particularly with respect to *shoeing;* as they will thus be enabled to walk and draw, both with greater speed, and with superior effect, when carefully shod. This operation is usually performed by *casting* them on their backs, when the farrier proceeds to affix the shoes, in a manner similar to that practised on horses. By such attempts, however, they are liable to numerous accidents; for the prevention of which, an ingenious machine has been contrived, in order to secure the animal by means of short posts. On these, the fore or hinder legs are fastened according to circumstances; and thus the shoes are applied, so that it is almost impossible to injure the helpless creature. The curious reader will find two neat engravings of this useful contrivance, in the 26th vol. of *Annals of Agriculture*.

Before we conclude this article, we shall mention the ingenious *Circular Ox-Stalls*, erected by the

late Mr. Hutcheson Mure, at Saxham, in the county of Suffolk; and which, we conceive, deserve to be more generally known. The structure contained forty-six beasts: the cabbage-carts entered at the opening in the circle; and, going round in the area, distributed the allowance of food to each animal directly into the manger, at the heads of the oxen: their dung being piled up in a circle round the whole building, formed a kind of wall, that afforded a convenient shelter to the cattle. For a minute account of this ingenious contrivance, the reader may consult the 31st vol. of the practical work above quoted, where it is also illustrated with an engraving. See Bull, Cattle.

Ox-eye Chamomile. See vol. 2. p. 82.

Ox-heel. See Hellebore, the Fetid.

OX-EYE, the Great White, Greater Daisy, Moon-flower, Corn Marigold, or Daisy Goldins; *Chrysanthemum Leucanthemum*, L. an indigenous plant, growing in dry meadows, pastures, and on walls: it flowers in the months of June and July.

The young leaves of this vegetable may be eaten in salads..... Horses, sheep, and goats relish this plant; but it is refused by cows and swine.

Bradley recommends the culture of this elegant flower, by dividing the roots, and planting them on the largest borders of gardens, three inches deep; as it grows quickly in any soil, but must be watered as soon as planted.

Dioscorides assures us, that the leaves of the great white ox-eye, when bruised, afford a good application to cold schirrous tumours; and that a decoction of them, if taken by persons subject to the jaundice, immediately after coming from the tepid bath, will tend to restore their natural colour:....we have had no experience of its medicinal effects.

OX-TONGUE, the Common, or Lang-de-boeuf, *Picris echioides*, L. an indigenous plant, growing on the borders of corn fields, and flowering in the months of July and August. When young, this vegetable affords an agreeable potherb: its juice is milky, and not too acrid.

OXYD, a term, in the antiphlogistic system of chemistry, denoting those compound bodies which are formed by the decomposition of *oxygen-gas*, either by means of metals, or certain other substances.

All *oxydes* are the basis of some metallic bodies, the most remarkable of which, were formerly known under the name of *calces* (or *magisteries*, if dissolved in acids), and have received their present appellation from the acidifying principle which they are believed to contain.

Metals are converted into *oxydes* by combustion, and by solution in acids: but, many of them acquire this form, by the action of the atmosphere alone; though they assume it with greater facility, when the latter is aided by moisture..... During the process of conversion into oxydes, metals are divested of their lustre; and, after increasing considerably in weight, they exhibit an earthy appearance. Speculative chemists have, therefore, lately conjectured, that all earths are metallic oxydes, and that they are all susceptible of reduction to a metallic state, provided there be

any matter for which oxygen has more powerful elective attraction than that, by which it is kept in combination with the bases of such supposed oxydes. As this opinion, however, is unsupported by actual proof, it cannot be admitted in the present system of chemistry.

OXYGEN, is a term invented by the French chemists, and at present employed to express the acidifying principle.

Oxygen is considered as an elementary *something*, utterly incapable of decomposition; nor will it admit of being exhibited by itself, or of being produced in its simple state: for, at the moment of its becoming free, it unites with the *light*, and *caloric*, or heat of the surrounding medium, and thus forms what has been severally denominated *vital-air*, *fire-air*, *dephlogisticated* or *pure-air*, and lastly, *Oxygen-gas*. The peculiar character of this elastic fluid was first developed by Dr. PRIESTLEY, whose experiments have been confirmed, and the properties of gas-oxygen fully explained, by LAVOISIER, CAVENDISH, and other illustrious chemical philosophers..... From their discoveries it appears, that this uncompounded invisible matter can be known only in its combinations; that it forms a constituent part of the atmospheric air, in which it exists in the proportion of 27 or 28 parts to 100.

Farther, oxygen may be separated not only from the atmosphere, but also from water; from all acids; and also from vegetables exposed to the rays of the sun. By this natural process, a considerable portion of it is evolved from the leaves of plants during their perspiration, in consequence of solar heat: thus, when oxygen is carried to their roots, by means of the circulating fluids, it is believed to promote their growth; though, if it be absorbed too copiously, and rapidly, it is unfavourable to vegetation. On the contrary, a very large proportion is requisite to conduce to the growth, and to nourish the vitality of animals. Lastly, oxygen is supposed to exist in all bodies, whether of the vegetable, animal, or mineral kingdoms, and particularly in certain metallic calces or oxydes; such as ruddle, calamine, and burnt clay; which on account of the large quantity of the acidifying principle they contain, are conjectured to be of considerable utility as manures.

[*Oxygen*, vital, or pure air, constitutes twenty-seven hundred parts of the atmosphere; it is indispensably necessary to the existence of life, and of combustion, and forms the principal part of all acids, whence its name. The other seventy three hundred parts of the atmosphere, consists of *azote*, (Septon) which takes its name from its inutility to life in animal respiration; it is also called nitrogene, because it constitutes the basis of nitre.]

OXYMEL, in pharmacy, a mixture of honey and vinegar, which are boiled to the consistence of a syrup.

Oxymel of Squills, consists of three parts of honey, and two parts of vinegar of squills, which are boiled in a glass vessel to the consistence of syrup. It is an useful expectorant, and resolvent in asthmas, coughs, and similar complaints, when the patient is oppressed with viscid mucus: it is generally given in doses of two or three small tea-spoonfuls, together with a little cinnamon, or other

aromatic water, to prevent the nausea which it frequently excites. In larger doses, it may be occasionally administered as an emetic.

OYSTER, or *Ostrea*, L. a genus of shell-fish, comprising thirty-one species, which are distinguished chiefly by the peculiar formation of their shells.

Oysters cast their spawn in the month of May, when they become subject to a periodical affection; the male-fish, having a black substance in the fin, is *black-sick*; and the female oyster, from a milky juice in its fin, is said to be *white-sick*: in June and July they begin to recover, and are in August perfectly sound.....They are saltish in the pits, more saline in the beds or layers, and very salt in the sea.

These shell-fish should be fresh, tender, and moist; as the want of fresh water renders them hard, bitter, and unpalatable.....Epicures give the preference to such as are edged with a small brown fringe, or beard, and which they erroneously suppose to be females. It is equally absurd to conclude, that the fine green observed in oysters taken from artificial beds, is the effect of copperas; as this substance, or a solution of it, is inevitably fatal to all fish.

Oysters are esteemed as excellent food, and are eaten both raw and dressed, in various ways: in a fresh state, however, they are doubtless preferable; for, by cooking, they are in a great measure deprived of their nourishing jelly, and of the salt-water which promotes their digestion in the stomach. Hence *raw* oysters may be used with equal advantage by the robust, the weak, and the consumptive. Independently of the nutritive effects peculiar to this shell-fish, it generally tends to open the bowels, especially if a certain quantity be swallowed at one meal: hence to persons of a costive habit, they afford a *dietetic supper*.

The shells of the oyster, like those of other crustaceous fish, are composed of calcareous earth, and animal glue. They possess no medicinal virtue superior to common lime-stone or chalk; but, by calcination, they yield a quick-lime, which is perfectly free from any metallic or other fossil substance; and being less permeable to water, when mixed with sand, it is better calculated for the plastering of walls in damp situations. Hence the Dutch prepare their excellent mortar generally of marine shells burnt into lime; which makes a most durable cement. The great importance of this fact, in point of health and economy, deserves equal attention; so that the immense quantities of oyster-shells annually thrown away in cities, might easily be converted into a very useful *shell-lime*.

P.

PAINT, a term used to express more particularly the preparations employed in painting houses.

[The danger to health, and other numerous inconveniencies attending the common method of painting with white lead and oil, have induced several persons to propose various substitutes; among others CADET DE VAUX, has published a process, which for cheapness and efficacy, appears to possess great advantages over the common methods. The way in which he prepares his paint is the following:.... Take of skimmed milk, two quarts, (2 Paris pints) fresh slacked lime six ounces and an half, Linseed, Caraway, or Nut oil, four ounces, common whiting three pounds; put the lime into a stone-ware vessel, pour upon it a sufficient quantity of milk to make a mixture resembling thin cream. Then add the oil a little at a time, carefully stirring it to make it mix thoroughly: the remainder of the milk is then to be added; and lastly, the whiting is to be crumbled and spread on the surface of the fluid, in which it gradually sinks; at this period it must be well stirred in, and the paint is fit for use. It is to be applied by a brush in the same manner, and in a few hours will become perfectly dry. Another coating may then be added, in the same manner as the former, and thus the work is completed. This paint is of great solidity, and possesses a slight elasticity, which enables it to bear rubbing even with a coarse woollen cloth without being in the least degree injured. It has little or no smell even when wet, and when dry, is perfectly inodorous; it is not subject to be blackened by sulphureous or animal vapours, and is not capable of injuring the health, all which advantages give it a decided superiority over the white lead paint.

The quantity of paint above mentioned is sufficient for covering twenty-seven square yards with one coating.

For out-door work, a much greater degree of solidity is given to the paint, by increasing the proportion of lime to eight ounces and an half; of the oil to six ounces, and by adding two ounces of white Burgundy Pitch. The pitch is to be melted by a gentle heat in the oil, and then added to the smooth mixture of milk and lime.

Decade Philosophique, No. 29. year 9th.

Citizen DARCET has proposed some alterations in CADET DE VAUX's method of painting in

milk, of which the following are the most important. In the first place, he finds that the oil adds nothing to the solidity of the colour, and is apt to render its tint dull and yellowish. The proportion of lime is also greater than is absolutely necessary, two ounces being sufficient for two quarts of milk. The proportion of whiting may be increased without inconvenience; five pounds, and even eight pounds of this substance have been used instead of the three pounds prescribed by CADET DE VAUX and the colour did not appear to be less solid, than that made according to the original receipt. The whey of the milk is however absolutely useless, all the glutinous part being contained in the cheese or curd; hence the following preparation is recommended by DARCET as cheaper and equally good with that proposed by CADET DE VAUX.... Take,

New Cheese or Curd	5 oz. avoird.
Slacked Lime,	$\frac{1}{4}$ oz.
Whiting,	10 oz.
Fine powd. Charcoal	1 dram.
Water	3 oz.

At the moment of commencing this process, a certain quantity of strong quicklime must be slacked in the least possible quantity of water, being then allowed to fall into powder, it must be sifted, in order to separate all the lumps. Of this powder a proper quantity being taken, is to be mixed up with the cheese, and pounded in a mortar till the mass is reduced to the consistence of new made glue. The whiting and charcoal being previously mixed with care, are to be diffused in the water and made into a liquid homogeneous paste. The mixture of lime and cheese is then to be added, and carefully mixed with the other; the colour is then finished.

In this state it may be kept for several days without injury; when used, it must be diluted with a proper quantity of water, and applied in the common manner. The quantity of materials above mentioned is amply sufficient for covering four square yards. All the advantages of the paint proposed by CADET DE VAUX are possessed by this. It has indeed even a greater solidity, is less disposed to become yellow, is more economical, and is not capable of becoming in the least degree spotted by water.

Decade Philosophique, No. 5, *year* 10.

Mr. CARBONEL a Spanish physician, proposes to substitute the serum (or water) of the blood of oxen, instead of the solution of glue commonly used to mix up the colouring matter employed for painting. After the blood has settled, the water must be poured off and strained, the adhesion of its integrant parts diminished by powdered quick-lime, taking care to preserve the mixture of a proper fluidity to be easily spread with the brush. The colour so prepared should be used as quickly as possible: and when any particular colour is wanted, the material for the purpose must be added at the time the lime is mixed: but as these additions diminish the strength of the composition, a few whites of eggs must be added to preserve the pro-

per degree of solidity; too many whites will subject the paint to scale off.

This paint can only be applied to wood or plaster not previously painted: a beautiful polish may be given to it by friction with cloths greased with *clean whale oil*. The *serum* or water must be *perfectly* free from *putridity*.]

In February 1799, a patent was granted to Mr. Joseph Tidmarsh, for his invention of a compound, which may be either substituted for paint, or mixed with other pigments, for enlarging their quantity, or reducing their price. The patentee directs the following articles to be pulverized, namely; glass, burnt clay, the slag of glass, copper, iron, or other manufactories; marble, spar, flint, or similar vitrefiable or calcareous earths. The powders, thus obtained, may be employed as a paint with the liquids commonly used in mixing colours; or they may be immediately incorporated with any kind of paint.

The following preparation, however, appears to be more simple, and is equally efficacious: it was first published in the *Bibliotheque Physico-economique*," for 1792, by M. Ludicke; who has employed it with great success for painting ceilings, gates, doors, and even furniture. He directs fresh curds to be bruised in an earthen pan, or in a mortar; after which they must be mixed with an equal portion of slacked lime: the result will be a white fluid, that may be applied with as much facility as varnish; but it will be necessary to employ such mixture on the same day, as it dries very speedily, and is apt to become too thick, if it be kept 24 hours....He observes that Armenian bole, ochre, and all pigments that are miscible with lime, may be incorporated in various proportions, according to the colour to be communicated; but some caution is necessary, in making such addition, to use the smallest possible quantity of water; as the painting will otherwise be less durable.

When two coats of this paint have been applied, it may be polished with a piece of woollen cloth, or other proper substance; in consequence of which, it will become as bright as any varnish; and, if the ceiling, &c. be exposed to moisture, it should be coated with the whites of eggs; by which expedient it will become as durable as oil painting. The principal advantages, derived from the use of this substitute, consist in its cheapness, and the facility with which the two coats may be applied, and polished; one day being sufficient for both operations. Hence, it deserves the attention of those whose lungs cannot support the disagreeable smell arising from oil paint; and who are not disposed to encourage the extravagant charges of house-painters.

[Mr. Hatchet has pointed out the great utility of prussiate of copper as a pigment. "During some late experiments," says he "I was much struck with the beauty of this precipitate, and was therefore induced to make several trials of it as paint: the result exceeded my most sanguine expectation." It has also been tried by Mr. West, Mr. Trumbull, and sir H. C. Englefield, in oil and water, who agree that in beauty and intensity it surpasses every brown paint now in use. It forms with white, various shades of lilac co-

lour, which do not appear liable to fade, like those which are formed of lake. The prussiate obtained from acetite, sulphate, nitrate and muriate, of copper, are all very beautiful; but the finest and deepest colour is afforded by the muriate. The best mode of forming this pigment, is to take green muriate of copper, diluted with ten parts of distilled or rain water, and to pour in prussiate of lime, until the whole is precipitated: the prussiate of copper is then to be well washed with cold water, on the filter, and to be dried without heat.

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A *Green Paint* for *inside walls.... Communicated by S. W. Johnson, esq.*

Take 4lb. of Roman Vitriol (Blue Stone) and 1lb. of Spanish whiting. Put these ingredients (being previously bruised, together) into an earthen vessel, and pour on them some warm rain or soft water. Simmer this over a slow fire for 3 hours, occasionally stirring it with a stick. Take it off and let it stand; in 24 hours the ingredients will subside, and the water become clear. Pour off the water, and in this state it will keep for years ready to mix for use at pleasure. When wanted, it must be mixed with water wherein a small portion of glue has been dissolved, and laid on the walls, (one, two, or three coats) as may seem necessary. 12lbs. of vitriol, and 4lbs. whiting will give 4 coats to a wall 40 feet by 24, and produce a lively and refreshing green.

The following composition is recommended for colouring and preserving gates, pales, barns, roofs, and timber generally, from the weather.

Melt 12 oz. of resin in an iron pot or kettle, add 3 gallons of train oil, and 3 or 4 rolls of brimstone; when they are melted and become thin, add as much Spanish Brown or Red or Yellow ochre (or any other colour you like, ground fine as usual with oil) as will give the whole the shade wanted. Then lay it on with a brush, as hot and as thin as you can. Some days after the first coat is dried, lay on a second.

It is well attested, that this will preserve plank for years, and prevent the weather from driving through brick work.

Another composition....Take three parts of slacked lime, two of wood ashes, and one of fine sand, or stone coal ashes; sift these through a fine sand sieve, and add as much linseed oil, as will bring it to a consistence for working with a painter's brush; great care must be taken to mix the ingredients perfectly. Two coats are necessary; the first may be thin, the second as thick as can conveniently be worked.

See also CEMENTS *vol. p.* 67.]

PAINTING of the Face, is a prostitution of the human countenance, too absurd to be described....See COSMETICS, and WASHING.

PALATE, or the organ of taste, consists of that flesh which composes the roof, or the upper and inner part of the mouth. It has a similar structure with the gums, but a greater number of glands, situated in the posterior part near the UVULA (which see), and secreting a mucus that serves to lubricate the mouth and throat, as

well as to facilitate deglutition, or the act of swallowing. These glands have a great number of apertures for the discharge of the secreted humour into the mouth: hence it will be understood that, if the stomach, or the glandular system, be in a disordered state, the palate likewise will become corrupted; and, that persons who continually stimulate their appetite with heating drugs, spices, liquors, &c. cannot expect to possess either a *natural relish* for plain and wholesome food, or a good digestion.... See MASTICATION.

For the cure of a vitiated palate, we cannot suggest a better remedy than *temperance*, and occasional *abstinence*. If, however, the mouth be affected with an unpleasant taste, especially in the morning, it generally originates from a foul or diseased stomach, which ought to be previously restored to its healthy state. As a palliative, or temporary remedy, we recommend frequent gargling and rinsing the whole mouth with infusions of aromatic herbs, or common tea slightly acidulated, or even toast and water; a practice equally conducive to health and cleanliness..... See also TEETH.

PALES, denote planks or pieces of larch, oak, or other hard wood, which are driven into the ground, and serve as a fence for parks, paddocks, gardens, and similar inclosures.

As pales are exposed to all the vicissitudes of the weather, in consequence of which they often rapidly decay, a proper method of rendering them more durable, is an object of importance to landed proprietors. With this view, the following varnish has been recommended:....Let any portion of tar be ground with as much Spanish brown, as it will bear without becoming too thick, to be applied in a manner similar to paint. The mixture must be laid on the wood by means of a large brush, and the work kept as free from dust and insects as possible, till the varnish be perfectly dry: thus, if the wood be smooth, it will acquire an excellent gloss, which preserves it against the injurious effects of air and moisture. Being not only cheaper, but drying more speedily, it is far preferable to paint; and may be advantageously applied to all other wood-work that is exposed....Should the glossy brown be disliked, a greyish-brown tinge may be imparted to the work, by mixing a small quantity of white-lead, and ivory-black, together with the Spanish-brown....[See PAINTS.]

PALM-TREE, or DATE-TREE, *Phœnix dactylifera*, L. a native of Syria, Palestine, Egypt, and other hot climates, where it grows to the height of 100, and even 150 feet.

Dates resemble in form the largest acorns, but are covered with a thin, semi-transparent, yellowish membrane; containing a fine soft saccharine pulp, of a somewhat vinous flavour; and within which is inclosed an oblong, hard kernel. They afford, when fresh, a very wholesome nourishment, and possess an agreeable taste. The best are obtained from Tunis, in a half-dried state.

There is an oil prepared from the fruit of this tree, known under the name of *palm-oil*; which is imported from the West Indies, whither the tree has been transplanted from Africa. It is of an orange-colour, and of the consistence of ointment; emitting a strong agreeable odour, but having very

little taste; both of which it entirely loses by long keeping; when it becomes unfit for use.....On the Coast of Guinea, this oil is said to be used by the inhabitants as a substitute for butter. In Britain, however, it is chiefly employed externally, for mitigating pains, cramps, and similar affections: it is likewise used for the cure of chilblains; and, if early applied, has often proved successful.

PALPITATION OF THE HEART, a violent and irregular action of that muscle, accompanied with great uneasiness and oppression of the breast.

This affection is obvious from the vehement pulsation of the heart against the breast, which is sometimes so great, as to be audible at a distance. It chiefly affects persons of sedentary occupations; those, whose periodical bleedings have suddenly ceased; and also, hypochondriac, hysteric, and scorbutic patients.

Palpitations of the heart originate from various causes; such as mal-conformation of that organ, or of some of the large vessels; wounds, abscesses, and ossifications in the vessels near the heart; all of which are *incurable*. It may likewise proceed from plethora; from fear; and from spasmodic affections.

Cure....If the patient be of a full habit, venesection will produce immediate relief; after which he ought to drink, liberally, weak and warm liquors; and to take moderate exercise in the open air. The first passages should likewise be cleansed, by means of infusions of rhubarb, and senna, or similar mild laxatives. Clysters will also be found occasionally serviceable: and considerable benefit has been derived from frequent bathing of the feet in warm water....In spasmodic cases, where the palpitation is induced by HYPOCHONDRIAC AFFECTION, HYSTERICS, &c. it may be relieved by employing the remedies pointed out, under the respective heads of those disorders.

PALSY, or *Paralysis*, a disease in which the patient is partly deprived of the power of voluntary motion; and which is often attended with sleep. One of the most frequent forms of the palsy is that, in which all the muscles on one side of the body are attacked, when the disorder is called a *hemiplegia*. If the power of motion and sense of feeling in the lower half of the body be impaired, the complaint is denominated *paraplegia*. Sometimes, also, it affects the tongue, lips, or other parts, in which cases it is termed *Local Palsy*.

Peculiarities: All the varieties of this complaint, more generally appear in the aged than in the young and robust....the left side is in most instances the seat of the disease.

Causes: Palsies are induced by whatever prevents the nervous power from acting on any particular part of the human frame..... The more remote causes are, intoxication, the immoderate use of tobacco, coffee, or tea; chronic rheumatism; wounds of the brain, or spinal marrow; suppression of customary evacuations; extreme coldness or dampness of the atmosphere; and indulgence in any of the violent passions: to these may be added, the inhaling of the noxious vapours of lead, quicksilver, or arsenic; or the injudicious medicinal use of those minerals, &c.

Persons liable to APOPLEXY, are

peculiarly disposed to the attacks of palsy; and likewise such as lead sedentary and luxurious lives, or who are often engaged in intense studies during the night, or have suffered great distress and anxiety, are frequently subject to this malady.

Cure: As paralytic strokes often occur without any previous symptoms, though the patient generally feels a considerable degree of languor, restlessness, and giddiness of the head, it will be advisable to pay the greatest attention to the nature of the disorder, and immediately to consult a professional man. In young and plethoric persons, the treatment must be similar to that pointed out in the sanguineous apoplexy (vol. 1st. p. 89) but, if blood-letting become necessary, small quantities only should be drawn at one time; beside which, stimulating blisters ought to be applied, and brisk purgatives administered....In the aged or decrepid, a contrary course must be adopted; the parts affected ought to be rubbed either with the flesh-brush, or with the hand; blisters, warm plasters, and volatile liniments, should likewise be employed. Considerable advantage has sometimes, been received from electricity, the shocks of which must be directed to the diseased part, from a blunt wooden point; and be repeated daily, for several weeks.

Should the palsy be consequent on apoplexy, it must be treated according to the directions given for apoplectic fits: if it arise from rheumatic affection, it may, generally, be relieved by similar management with that to be followed in the RHEUMATISM. In palsy, originating from mineral exhalations, it will be useful to resort to warm, nervous, and de-obstruent medicines; and to apply blisters to the part affected; but, if it be induced by the imperceptible inhalation of lead, we refer to the most appropriate method, pointed out under the article LEAD.

Lastly, when the violence of the disease is happily reduced so as to admit of the patient taking exercise, this beneficial practice should be cautiously and regularly pursued: he ought to avoid all cold damp air; to wear flannel next the skin; and, if possible, to remove into a warmer climate.

PANIC, or PANICK-GRASS, *Panicum*, L. a genus of plants, comprising 97 species, five of which are natives of Britain: viz.

1. The *verticillatum*, ROUGH-PANICK, or KNEED-GRASS.

2. The *viride*, or GREEN PANICK-GRASS.

3. The *Crus-galli*, or LOOSE PANICK-GRASS (more properly Cock's foot Panick) is found in wet cornfields.

4. The *sanguinale*, COCK'S FOOT, or rather WILD PANICK with blood coloured stalks, growing in corn [wheat] fields: it flowers in the month of July or August....All the stems of this plant that lie near the ground, and are about 12 inches long, take root; so that each produces five ears and upwards..... though it is an annual, and seldom flourishes for any considerable time, it increases and spreads widely in gardens, where it is a very troublesome weed....BECHSTEIN observes, that the Wild Panick, which, in its natural state, is an almost useless plant, may be cultivated with great advantage on a dry, loose, sandy soil. In such situations, it will produce oblong, smooth, yellow-

ish and semi-transparent grains; which, after being divested of their husks, afford an excellent ingredient in puddings; and may also be converted into flour and bread.

5. The *dactylon*, or CREEPING PANICK-GRASS. Its roots may be employed for the same purposes as those of the DOG'S-GRASS, to which we refer.

Although the different species of Panick are course grasses, when cultivated in a *rich* soil, yet, we believe that few native plants deserve more the attention of those farmers, who possess large tracts of a light, *sandy* nature, where scarcely any other vegetable will prosper.

PAPER, a thin flexible leaf, which is generally prepared of vegetable substances, for the purposes of writing, printing, &c.

The original invention of paper being lost in the uncertainty of tradition and antiquity, we shall not enter into any disquisition, respecting those nations, among whom this valuable article was first manufactured; though the Chinese appear to have the strongest claims in point of priority: hence we propose to confine our account to the materials of which paper is actually made, as well as those substances, from which it may be advantageously procured.

In Europe, paper is manufactued chiefly of linen rags; which, after being sorted into different classes, according to their respective qualities, are first carried to a machine, called a *cutting-table*, where they are divided into minute pieces; and thence to an engine, denominated the *duster*; which is covered with a wire-net, and put in motion by machinery; so that, by the rapidity of its motion, it separates the dust from the shreds, and forces it through the wire.

The rags are now reduced to a pulp of a proper consistence for making paper: this operation is effected in mills, by the joint action of water, and cylinders provided with iron blades; after which the stuff is conveyed into a general repository, that supplies the vat or vessel, whence the pulp is drawn.

In order to *cast* this pulp into paper, the workman immerses in the vat a mould, composed of wire-cloth, and furnished with a frame to retain the stuff: thus, he draws as much of the pulp as is necessary to form one sheet, on which he lays a felt for the purpose of absorbing the moisture; and thus he continues, placing alternately a sheet and a felt, till he has formed six quires of paper, which is called a *post*. When the last sheet of the post is covered with a felt, the whole is pressed; after which the sheets are suspended on cords in an airy room to dry, and then to undergo the process of *sizing*. This is performed by plunging a few sheets together, and turning them, in a vessel full of *size*, which is prepared of the shreds and parings of tanners, curriers and parchment-makers; and into which a small portion of alum is thrown, before the sheets are immersed.

The paper is now carried to the drying room; and, after being gradually dried, it is conveyed to the finishing room; where it is submitted to the action of the press; selected; examined; folded; formed into quires of 24 sheets, and, finally, into reams, consisting of 20 quires each.

Thus manufactured, it is called *writing-paper*; as it is adapted for this purpose by the process of sizing. There are, however, various other sorts, such as *blotting*, *brown*, and *coarse* papers which will not bear ink without *sinking*. To these may be added, the different sorts of paper intended for *drawing*, *engraving*, and *printing*; which, though prepared in the usual way, are not sized so thoroughly as that designed for the pen.

Paper being an article of extensive utility, for literary, commercial and domestic uses, many vegetables have been discovered, which may be advantageously substituted for rags....In justice to those ingenious men, who *first* devoted their attention to this important subject, we shall only remark, that many schemes had been proposed, but none carried into effect, previously to the year 1751; when GUETTARD, in France, and, in 1765, Dr. SCHAEFFER, in Germany, published their experiments; and communicated to the world *new* specimens of paper, made of the bark, leaves, wood, straw, &c. of different plants, shrubs and trees. Soon after that period, the works of M. de VILLETTE, who described the properties and uses of different plants, were printed on paper manufactured partly from the *marsh mallow*, and partly from the bark or rind of the *Lime-tree*, or *Linden-tree*: it deserves to be remarked, that the paper obtained from the former, was tolerably fine, and of a yellowish-green shade; that from the latter, was somewhat coarser, and of a reddish-brown cast; both were smooth, equally fit for printing and writing, but especially for drawing. Another French manufacturer, however, LEVIER DE LISLE, has been erroneously considered as the original inventor of the art of converting raw vegetable matter into paper; though his specimens are said greatly to surpass those produced by SCHAEFFER, in Germany....We shall here briefly enumerate the principal of those specimens; namely, from *nettles*, dark-green; from *hops*, dark-brown; from *mosses*, greasy or dusky-green; from *reeds*, light-green; from three species of the *conferva*, different shades of green mixed with grey; from the bark of the *willow*, reddish-brown; from the wood of the *hazle-nut-tree*, white as milk; from the bark of the *oak*, reddish-brown; from that of the *poplar*, somewhat lighter than the preceding; from the *osier*, nearly of the same tint; from the *elm*, somewhat darker-brown; from the *burdock*, and the leaves of the *thistle* (Chardon) a green and white spotted paper.

In conducting experiments with plants, the following remarks of SCHAEFFER deserve attention..... The boiling of vegetable substances, or the wood itself, in alkaline solutions, with a view to soften them, and facilitate their conversion into a pulp, is of no service, as, notwithstanding such treatment for several hours, they not only remained hard, but likewise assumed a yellow cast, though they had formerly been white. Even immersion in pure water affects the colour of vegetables; hence it is most advisable to carry them as fresh and expeditiously as possible to the mill to convert them into pulp; to draw the paper; and suspend the sheets to dry in an airy

place. Though *lime-water*, if employed for macerating vegetables, that are to be made into paper without rags, facilitates the decomposition of the former; yet, at the same time, it imparts a *yellowish* cast to the paper: such discoloration, however, may in a great measure be obviated by long-continued washing of the materials in the engine, during their conversion into a pulpy mass. Plants of tender fibres, which are naturally soft and pliant, require no lime-water, especially when they are to be reduced in a fresh state; but, for those that are dry, hard, and of a woody consistence, lime will be indispensably necessary; as otherwise the paper manufactured of them, always remains brittle, and unlike that obtained from rags.

Among the different productions of the vegetable kingdom, which have been employed in the manufacture of paper (before any attempts to that effect were made in Britain), we shall enumerate chiefly the following:

1. *Cotton*, when treated in a manner similar to that practised with linen rags, affords an excellent paper, which is incomparably more durable, and better calculated for writing; on account of its uncommon whiteness, great strength, and fine grain: it was first invented in Greece; and at present forms a very extensive branch of the Levant trade.

2. The pith of the various species of *Thistle* have been employed with success by SCHAEFFER, who first decorticated the stalks of this plant, bruised them, extracted the inner spongy substance, and sent it in a fresh and sappy state to the mill: after being worked three hours, it afforded, without rags, a tolerably white paper. Dr. BOHMER, however, observes, that the white *down* growing on the *Cotton-thistle* (*Onopordon Acanthium*, L.) might be more easily collected and usefully employed for this purpose.

3. The *Whiten*, or *Sallow* (*Salix caprea*, L.) In the year 1788, the *Society for the Encouragement of Arts*, &c. conferred their silver medal on Mr. GREAVES, of Mill Bank, near Warrington, for preparing 20 quires of paper from the bark of this tree. The quantity of the material employed, was about six cwt. which had been stripped off the twigs in the month of September; and two-thirds of which were *heckled* and dried, in a manner similar to hemp, so that it was reduced to one cwt.: the remainder was dried in its natural green state, by which it lost one half of its original weight. The heckled bark was then chopped small; worked in the usual manner, and produced eight quires of a finer kind of paper: from the other, Mr. GREAVES obtained 24 half quires of coarser paper; which, though not in all respects equal to that manufactured of linen rags, nevertheless "seems likely to answer some valuable purposes hereafter, when the mode of working raw vegetable materials, shall be better understood." Mr. G. is of opinion, that paper may thus be obtained at one half of the expence usually incurred in the common mode of preparing it from ropes or rags; and that it will be more serviceable, when made of the bark and leaves in a *green state*.

4. *Hemp*, is one of the most proper plants for being converted into paper, provided it could be procured at a reasonable price. DU HALDE informs us, that the inha-

bitants of Nangha, in Japan, macerate this plant in lime-water, beat it, and then immediately prepare their paper. GUETTARD asserts, that the very *shaws*, and other refuse from the stalks of hemp, may be made into a good and strong packing-paper. In order to improve shaws, they ought to be dried in an oven; when the small, woody particles should be separated, by beating them with thin sticks; next, the clean and pure material must be suffered to putrefy, and afterwards treated in a manner similar to old rags. FONDI, an Italian author, relates, that from *shaws* alone, he obtained a paper resembling the finest sort manufactured in Holland, after exposing them to the open air, for a whole winter: thus, from time to time, a white pellicle appeared on the surface, till their woody substance is entirely decayed; this coat or skin should be occasionally removed, being one of the best substitutes for linen rags. *Press-boards* have, in this country, always been manufactured of *shaws*; and we have no doubt but that the latter may be rendered subservient to more valuable purposes.

5. *Hop-bines*:....Dr. SCHAEFFER plunged them for fifteen minutes in boiling water, then separated the rind from the woody substance, cut the latter into small pieces, and sent it to the engine. After being worked eight hours, they became fibrous, pulpy, and were fit to be formed into paper: on adding rags, the sheets assumed a whitish appearance; but, without them, had a brownish shade, and were uniformly of a firm consistence.

6. The stalks of *Brown* or *Blue Cabbage*, when deprived of their external skin, macerated for twelve hours in lime-water, then reduced to a pulp, afford, with the 20th part of rags, a good white paper.

7. The dry down of the CAT'S-TAIL: See vol. ii. p. 31.

8. The stalk of the *Mallow*, and particularly those of the *Alcea rosea*, L. from which a fine and white paper may be prepared, without adding any rags.

9. *Maize* (Indian corn,) from the leafy husk of this fruit, according to PLANCUS, the most beautiful post-paper is prepared in an Italian mill, near Rimini. SCHAEFFER made an experiment with the whole plant, and obtained a greyish paper; but, after steeping the pulp four days in lime-water, the sheets acquired a greenish shade.

[The Editor saw a book, printed at Regensburg in Germany in 1771, upon paper from a variety of substances, and among others, there was one leaf made from the Indian corn or maize husks.]

10. From the woolly catkins of the *White Poplar*, SCHAEFFER also obtained an excellent smooth paper; having previously cut them into small pieces, and then submitted them for three hours to the operation of the engine: he remarks, that the pulp was easily drawn, formed into sheets, pressed, sized, &c. The paper made of the woolly substance produced by the Black Poplar, was grey, and neither firm, nor free from knobs.

11. The stalks of the *Common Broom*, after depriving them of the external rind, afford, without rags, a solid writing-paper.

12. The *Shaws of Flax*, together with other refuse from that article, have lately been used with advantage by the German paper-makers: it is well known, that the stalks of the flax-plant may be employed in

their natural state for this purpose; but the expence would not be equivalent to the profit: hence the *shaws* ought not to be thrown away as useless.

13. The stalk of the *Common Sun-flower* (Helianthus annuus, L.) contain a large portion of a white, shining, fibrous substance, which, more, than any other, deserves the attention of the manufacturer.

14. *Peat* has, at Erfurt, lately been converted into an useful wrapping-paper, paste-boards, playing-cards, &c. without the addition of rags:....we conceive, it would afford a good material for paper-hangings.

15. *Grass-wrack*, (Zostera marina, L. vol. iii. p. 202) is with great advantage employed in North-Holland, where most of the packing-paper is manufactured of this marine vegetable.

16. The tendrils of the *Vine*, after having undergone the putrefactive fermentation, yield a beautiful paper.

17. The Common *Horn-beam Tree* (Carpinus Betulus, L. vol. ii. p. 311). The shavings merely washed, and submitted to the mill, were made into a tolerably white paper.

18. The stalks of the *Mugwort* (*Artemisia Absinthium*, L. vol. iv. p. 118), when soaked for several days in lime-water, and reduced to a pulp, were formed into a whitish writing-paper; but that produced from the external rind was fit for all the purposes of packing.

19. The stalks of the *Clematis*. ....See Traveller's Joy.

20. *Barley-straw* is, perhaps, the most abundant and profitable material which might, in this respect, serve as a substitute. Dr. SCHAEFFER (whose inventions have not always been acknowledged by an ungrateful posterity) obtained a yellowish paper of this straw, after soaking it in boiling water, then steeping it in lime-water, and adding the 20th part of linen rags.

[21. A very good paper for common purposes may be made from an East-India article, called PAUT, or JUTE, *Crotalaria Juncea:* it is the same from which Gunny bags are made. The plant which yields the fibre, whence this flax-like substance is obtained, is called by the natives *Paat;* the fibre is called *Jute:* and is much cultivated in Bengal for making sacking. The editor has seen a good brown paper from this article, which answered for printing and writing, equally well with paper made of rags; and recommends to the numerous Americans who visit India, to bring over a quantity of the seed, which would, doubtless, thrive in the southern states, and in the newly acquired territory of LOUISIANA. The demand for rags is so *incredibly great*, that recourse must be had to some substitute, which may be used to make common paper. It would hardly be believed, that *rags* are profitably imported into the United States, in immense quantities from LEGHORN, and that the paper of great part of the present work is made from them.

22. It is stated above, that paper has been made in Germany from three species of *Conferva*, and it may be of importance to note, that Chancellor LIVINGSTON has recorded a successful experiment in making very good hanging and wrapping paper with little trouble, from a species of the same plant, growing in immense quantities in the river Hudson. No doubt the same material may be found in

other rivers in the United States. Manufacturers of paper will find it their interest to attend to this fact, for the demand for every kind of paper is annually increasing in the United States, and the deficiency of rags is already felt, as stated above.]

In a late volume of the "*Annales de Chimie*," we meet with some useful hints relative to the manner of re-manufacturing the paper of old books (or even new ones of a certain description), or any letters, or other paper already used for writing or printing; by M. M. De Yeux, Pelletier, Molard, and Verkaven.

I. *Process for re-fabricating Printed Paper:*....All paper of the same quality should be collected, and separated from such as may have any writing on the pages; the edges of those leaves which may have become yellow, and also the backs of books, being cut off by the instrument used by book-binders....One hundred weight of paper is now to be put, sheet by sheet, into vats, sufficiently capacious to contain it, together with 500 quarts of hot water; but which ought to be filled about one-third: ....the whole is next stirred by two men for the space of one hour, who are gradually to add as much water as will rise about three inches above the paper; after which it is left to macerate four or five hours; the agitation being occasionally repeated, so as to separate, and at length to form the paper into a kind of paste.

The water is now drawn off by means of pipes, and the pulp conveyed to the mill, where it is to be coarsely ground for one hour; at the expiration of which, it is boiled in a chaldron for a similar space, with a sufficient quantity of water to rise four or five inches above it. A short time before the mixture begins to boil, thirteen quarts of caustic ley of pot-ash are to be added to every cwt. of paper. The ley alluded to, is prepared by dissolving 100 *lbs.* of pot-ash in 300 quarts of boiling water, to which are to be added 20 *lbs.* of pulverized quick-lime; and the whole must be briskly agitated, till it become of an uniform consistence, when it is suffered to stand for 12 hours; at the end of this time it must be drawn off, and 75 quarts of boiling water added to the sediment, which being stirred for half an hour, and suffered to stand till it become clear, is to be mixed with the liquor first decanted.

When the paste has boiled in this ley for one hour, the fire is to be extinguished, and the matter suffered to macerate for 12 hours; after which it must be taken out, drained, put into bags, and submitted to the action of a strong press for a similar length of time, to deprive it of all moisture; and, if it appear white, so that the printer's ink be properly extracted, it may be re-manufactured in the usual manner.

II. *Process for the re-fabrication of Written Paper:*.....The paper must be sorted; the yellow edges cut off; and the whole thrown, leaf by leaf, into a tub half-full of boiling water, where it is to be agitated as before directed. After it has macerated four hours, the water should be drawn off; a fresh quantity of boiling water added; and the mixture stirred for half an hour; at the expiration of which the paper is again left to dissolve for three hours.

The fluid is now drawn off, and

260 quarts of *cold* water poured on each cwt. of paper; which being perfectly mixed, 6 *lbs.* of oil of vitriol are to be gradually added; and the whole strongly agitated for a considerable time, that the paper may thoroughly imbibe the liquor.

This composition is next suffered to macerate for twelve hours; the agitation being occasionally repeated, when the tub is to be filled up with cold water; and the mixture again stirred, to wash the paper, which will now be reduced to a perfect paste. Lastly, after drawing off the water, the pulp must be put into bags, pressed, and ground in a mill; after which it is conveyed to the vat, and worked in the manner practised with linen rags.

In the year 1801, a patent was granted to Mr. Koops, for extracting ink from printed paper, and restoring it to its original state. His process varies little from that above described; the paper being agitated in hot water, to extract the size, and reduce it into a pulp: next, the adhesion of the ink is to be removed by a caustic alkali prepared of lime and pot-ash, the quantities of which, should be proportioned to those of the paper. After discharging the ink, he directs the pulp to be bleached by means of the oxygenated marine acid, in the proportion of 10 or 12 gallons to 140lbs. of the mseterial; and, when sufficiently whitened, it is re-manufactured in the usual manner. According to the patentee's account, *writing paper* does not require so large a proportion, if any, of the caustic alkali; but is bleached by confining it in a wooden box, rendered air-tight; into which the acid gass is thrown directly from the retort wherein it was produced.

The *staining*, or *dyeing* of *paper*, is performed by applying, with soft brushes, any of the colours used for tinging other substances, after tempering them properly with size or gum water. Should the paper not be sufficiently hard to receive the tint without sinking, it will first be necessary to *size* it, or to employ a larger proportion of gum with the tinging matters. And, if the paper is to be of an uniform colour, the latter must be fixed by several thin coatings, each being suffered to dry, before another is applied; as the shade will otherwise appear unequal.

As writing paper is often improperly *sized*, in consequence of which the ink is apt to sink, it has been recommended to dissolve a small piece of Roman alum in a glass of pure water. This liquor should be gently spread over the suspected part, with a soft sponge; and, after becoming dry, it may be safely used for writing. Should there be any occasion to write on a printed book, or on paper that is too fresh and moist, it will only be necessary to mix a little gum with the ink. Lastly, in case any book or manuscript be stained with oil, or grease, it has been directed to calcine and pulverize the bones of sheep's trotters; and to apply a small portion of the powder to each side of the stain, which should be placed between two sheets of white paper, and the whole submitted for the space of twelve hours to the action of a press: if the stains do not disappear, the process should be repeated in a warm place.

Various patents have been granted for inventions or improvements, in the different branches of the paper-manufacture; but as the speci-

fication of them would benefit only a small part of our readers, we shall not enter into particulars..... the following, however, deserves to be noticed, namely: Mr. HOOPER's, in 1787, for his invention of a paper for printing; and, in 1790, for making paper of different sorts from *leather-cuttings*; Mr. CUNNINGHAM's, in 1794, for manufacturing paper from various materials; Mr. BIGG's, in 1795, for a cheap and expeditious mode of bleaching paper; and Mr. CARPENTER's patent, obtained in the same year, for a new method of bleaching in the water-leaf or sheet.

PAPER-HANGINGS, are a particular kind of paper, which is much thicker than that used for the purposes of printing, writing, &c.; so that it is manufactured solely for hanging or lining the walls of rooms. Such papers are coloured in various ways; but, as a description of these processes would trespass on our limits, we shall merely take notice of a patent, which was granted in 1793, to Mr. ECKHARDT; for his method of preparing and printing paper-hangings in different patterns, and silvering them so as to resemble damask, lace, and various silk stuffs. The patentee directs the paper to be coloured in the usual manner, and a proper coat of size, consisting of solutions of isinglass, or parchment, to be applied. When this *ground* is sufficiently dry, a gold size, or other preparation, may be substituted, and laid on those parts, on which the ornaments are intended to appear. Before the gold size is perfectly dry, leaves of silver are spread over it; the paper is sized two or three times; and then finished with such varnish as will resist moisture.

To conclude: As many accidents happen by the all-devouring element of fire, both to printed and written papers, as well as to hangings, when entrusted to improvident persons, we shall communicate a very simple, but effectual, method of rendering all sorts of paper *fire-proof*. Such desirable object may be easily effected, by immersing these combustible materials in a strong solution of alum-water; and, after drying them, repeating this immersion, if necessary. Thus, neither the colour, nor the quality, of the paper, will be in the least affected: on the contrary, both will be improved; and the result of the experiment may be ascertained, by holding a slip of paper so prepared over a candle.

PARCHMENT, the skins of sheep or goats, prepared in such a manner, as to be subservient to the purposes of binding books, the reception of ink, &c.

The wool is first stripped off the skins, which are plunged in a lime-pit for the space of 24 hours, then taken out, drained, and stretched on a kind of frame; when the flesh is scraped off by means of an iron instrument. Next, they are moistened with a wet rag, then sprinkled with pulverized chalk, rubbed with a pumice-stone, and afterwards with the instrument; when the skins are again moistened, rubbed with the pumice-stone, drained, and the iron instrument is passed a third time over them. The *wool*, or *hair-side*, undergoes similar operations; and the whole being carefully extended on the frame, the flesh-side is again scraped; when it is a second time sprinkled with pulverized chalk, which is afterwards gently brushed off, and the skin again suspended, that

it may become perfectly dry.

The next operation is that of *paring*; when the skins are reduced to one half of their thickness; and rendered smooth by the action of the pumice-stone. The parings are consumed in making size, glue, &c. while the skin is employed for ingrossing deeds, and other purposes.

There is a finer sort of parchment, kown under the name of *vellum*, which is prepared from the skins of sucking-calves. It is manufactured in a similar manner with the first mentioned article, excepting that it is not immersed in the lime-pit. A very excellent *glue*, or *cement*, may be obtained by boiling the small shreds of vellum, so as to convert them into a jelly; but care should be taken that no fragments of parchment be used, because the skins of goats and sheep are unfit for such purpose.

For a simple method of restoring damaged parchment, so as to render the writing on it legible, see the title DEED, in our 2d volume.

A patent was lately granted to Mr. HITCHCOCK, *for converting old skins of parchment or vellum into leather*. Although we doubt the practical tendency of the patentee's ingenious, but complicated processes; yet, in the present instance, as they may be applied to other useful purposes, we shall observe, that he endeavours first to reduce the skins to their natural state, by washing them well and often in water for 24 hours; then removing them for a similar time to a bath composed of 1½lb. of white vitriol, 1lb. of cream of tartar, and 1oz. of sal ammoniac, dissolved in 20 gallons of water. In order to soften their texture, and to discharge the lime, he adds to this liquor 10lb. of oil of vitriol, 1lb. of aqua-fortis, and one pint of spirit of salt; in which *acid bath* the skins are to be steeped only for a short time. After washing them properly, rinsing out all the acid, and completely wringing out the water, without tearing the skins, they are to be immersed and well soaked in a *tanning liquor*, composed of 20lbs. of oak-bark, 7lbs. of sumach, 5lbs. of elm-bark, 3lbs of sassafras, and the same quantity of lignum-vitæ shavings mixed with 20 gallons of water, previously *warmed* (probably, *boiled*), for 12 hours, and cooled to the temperature of new milk, before the skins are immersed. Next, they are to be tanned in the common way, with oak-bark, or oak and sumach, then washed and dried. Lastly, to make the renovated leather *water-proof*, it should first be soaked for five or six days in linseed or nut-oil; and, after wringing out the superfluous oil, the skin ought to be repeatedly dressed with the following composition: Take 7lbs. of nut, or linseed oil; red lead, litharge, sugar of lead, white vitriol, bees-wax, resin, and pitch, 1lb. of each: melt them together over a moderate fire.

PARING OF LAND, an ancient practice in agriculture; but which has, within a few years, been exploded in various parts of Britain. It consists in cutting off *old* turf at such a thickness as the labourer can conveniently effect; together with the more recent turf, at such a depth as will render it sufficiently dry for BURNING....See p. 447 of our first volume.

Paring is chiefly practised on breaking up land from a state of

nature; though it is with advantage employed *periodically*, on cultivated ground. An instance of this fact occurs in the 24th vol. of *Annals of Agriculture*, where the industrious Mr. Boys states, that several acres of wheat, barley, oats, and sainfoin, were at that time growing on soil, which had been repeatedly *pared* and *burnt*. He adds, that the crops were of sufficient value to buy the land at more than *forty years purchase*, at a rent fairly computed before the improvement. Hence it appears, that such practice, in the hands of judicious farmers, is excellent: and Mr. MIDDLETON observes, in the 12th volume of the same work, that it almost invariably secures a large, first crop of turnips; which, (when fed upon land well stored with ashes) are the best preparation for subsequent crops, and that there are very few (if any) cases, in which, with proper management, paring has not perfectly succeeded.

[" In performing these operations of paring and burning, the Rev. Mr. E. CARTWRIGHT directs, that " Care should be taken to do it with a smothering heat; for if the fires are too intense, the ashes will be of inferior quality. The advantages of this practice are numerous: it, in a great measure, annihilates seed weeds; it is destructive to many kinds of insects and other vermin, noxious to agriculture; it decomposes whatever comes within the sphere of its activity; and the ashes it produces, neutralize the soil, and assist in the farther decomposition of the vegetable and animal matters contained in it; and these substances it converts into suitable food for the future crop. Its operation on the soil is something analagous to the operation of malting on grain; as malting disposes the grain to part freely with its most nutricious principle, the saccharine matter; so will paring and burning dispose the soil profusely to part with its nutrition to the plants which are committed to it; and this it will do, not for a single year only, but for several years, according to the original degree of fertility, in succession; and if the crops are exhausting ones, till it is soon worn out. Hence on pared and burnt land, more so, perhaps than on any other, no two exhausting crops should follow each other. By exhausting crops, are understood, wheat, rye, barley, oats, and [buckwheat]; by fertilizing ones, crops of every kind which are consumed upon the land or mown, or carried off before they perfect their seed, and which are brought back again in the state of manure."]

PARK, a tract of ground inclosed, for the retention and propagation of animals of chase.

The best inclosure for a park is doubtless a brick or stone wall; but, as the erection of either is attended with great expence, the same purpose may be effected by *paling*; which ought to be made of the soundest heart of oak, and firmly fixed in the ground, to prevent any animal of prey from penetrating. To render it more secure, it will farther be advisable to train a quickset hedge to a considerable height, which should be kept in perfect order.

PARSLEY, the COMMON, or *Apium Petroselinum*, L. is a native of Sardinia, whence it has been introduced into Britain. It is propagated by seed, which according to MILLER, should be drilled (early

in the spring, as it remains several weeks under ground) in the proportion of two bushels per acre ; in rows about one foot asunder, and *hand-hoed ;* though Mr. Mills (in his *Practical Husbandry*, vol. iii.), is of opinion, that the plants will flourish better ; grow to a larger size ; and be in all respects more perfect, if the distance between the rows be sufficient to admit a hoe-plough. He adds, that a smaller quantity of seed will be required ; the culture will thus be less expensive, and, he is confident, the plants will afford better food for cattle.

This vegetable is eaten with great avidity by sheep ; as it not only renders their flesh more delicious, but is also believed to preserve them from the *rot ;* instances have occurred, where sheep fed on parsley remained sound, while those in the vicinity of the farm were uniformly subject to that disease. Mr. Mills, therefore, recommends these animals to be fed with it, twice in the week, for two or three hours at each time....It may likewise be beneficially given to sheep affected with the *scab* or *red-water* ; and is said to be very efficacious in recovering *surfeited* horses, or such as are subject to the *grease*.

Besides its utility for feeding cattle occasionally, parsley is cultivated to a considerable extent in gardens, for culinary purposes.... Its seeds possess an aromatic flavour, and are sometimes used as carminatives : the root is of a sweetish taste ; being slightly pungent and aromatic ; it is principally employed in diet drinks ; but, if taken too liberally, is apt to produce flatulency.

PARSLEY, the Bastard Stone, or *Sison*, L. a genus of plants, consisting of eight species, four of which are natives of Britain. The principal of these is the *Amomum*, Common Bastard Stone-Parsley, or Hedge Honewort ; growing in moist woods and hedges ; flowering in the month of June....Its small, brown, striated, and oval seeds, possess a warm, aromatic flavour ; being reputed to be aperient, diuretic and carminative, they were formerly used instead of the genuine Lesser Cardamon.

PARSLEY-PIERT, or *Aphanes arvensis*, L. a low, indigenous plant ; growing in corn-fields, and in dry gravelly lands ; flowering from the month of May till August....It is eagerly relished by sheep, and may also be used as a salad-herb....In its medicinal effects, it is strongly diuretic ; and supposed to be an effectual solvent of the stone in the urinary bladder.

PARSNEP, or Parsnip, *Pastinaca*, L. a genus of plants, comprising three species, of which only the *sativa*, or common Wild Parsnip, is indigenous. It grows on the borders of ploughed fields, in calcareous land, and flowers in the month of June or July....As no cattle will touch this weed, it ought to be carefully eradicated.

In a cultivated state, this plant is known under the name of the *Garden Parsnip ;* which requires a rich deep loam, though it will also thrive in sandy soils : on the contrary, wet and stiff land is very unfavourable to its growth.

Parsnips are propagated by seed, which should be sown in the months of February or March ; and likewise in autumn, immediately after

the seed is ripe; as otherwise the young plants will be over-run with weeds. If the seed be broad-cast, the plants must be thinned to the distance of 10 inches, or one foot, asunder: in case it be drilled, the rows ought to be 18 inches apart; the roots being also left at the distance of 10 inches from each other; horse-hoed twice; and earthed up after the second operation, but not so as to cover the leaves.....They are very hardy; and, if allowed to remain in the ground, are not injured by the severest frost.

Parsnips are of great value both for feeding cattle, and likewise for culinary purposes. They are reputed to be equal, if not superior, to carrots, for *pigs*, which eat them with avidity, and fatten speedily, while their flesh becomes much whiter. If washed clean, and sliced among bran, horses eagerly devour the parsnip-roots, and thrive well; nor are they easily heated, or liable to the disorders that often attack these useful animals, when fed with corn.

Parsnips fatten sheep and oxen in a very short time; and the assertion of the Jersey Society of Agriculture, that these roots "*will fatten a lean beast in three months*," has been verified by the experience of the Rev. Dr. De Salis, on whom the Society for the Encouragement of Arts, &c. in 1799, conferred their silver medal, for the cultivation of those excellent roots, for the above-stated purpose. ....Hence they are particularly valuable as a winter food. The beef of cattle fattened on them, together with hay, is said to excel that produced from the best pastures alone: ....the milk of cows thus fed, is not only richer, but yields butter of a fine saffron-colour, which is equal to that obtained from them, when feeding on the most luxuriant grasses.

If parsnips are to be housed, they ought to be taken up, when the leaves begin to decay; and these should be cut off three or four days before they are stored. It is not, however, advisable to dig them out early in the morning, before the dew is dissipated; as the leaves then contain a scalding fluid, and excite blisters, which continue troublesome for several days.

Considered as human food, parsnips are exceedingly nourishing. In the North of Ireland, they are brewed with hops; and, when fermented with yeast, afford an agreeable beverage: they may also be preserved in sand for culinary use; and, if reduced to a *dry* state, by cutting them in oblong slices, which ought to be suspended on strings, either in a warm room, or the open air, such roots will remain sound for any period of time. Hence, they promise to be of considerable service on long voyages; for, by soaking them in warm water for the space of one hour, previously to the process of boiling, they will become as tender, and will taste equally sweet, as if they had been newly brought from the garden.....There is, however, a precaution which deserves to be stated; namely, that parsnips should never be dug up in the spring; because, when the roots at that season are growing upwards for producing seed, their juices acquire a poisonous quality; and instances have occurred, in which the internal use of them has been productive of fatal effects on the human constitution, such as furious madness: this

remarkable phenomenon in vegetable nature, we relate on the authority of M. Bechstein.

The seeds of parsnips are slightly aromatic, and contain an essential oil, which, according to Dr. Withering, "will often cure intermittent fevers."

This fibrous root possessing a peculiar sweetness, Prof. Hermbstaedt was induced to make various experiments, with the view of extracting sugar. He caused a parcel of such roots, weighing 24lbs. to be pounded in a stone mortar, with the addition of a little cold water; after which the juice was expressed, the residuum washed in pure water, and likewise submitted to the action of a press: the result was a turbid, sweet liquor. After standing in a cool place for a few days, till it became clear, and evaporating it over a moderate fire, Prof. H. obtained 5½lbs. of an agreeable syrup.

PARSNEP, the Water, or *Sium*, L. a genus of plants, comprehending sixteen species, four being natives of Britain; and the most remarkable of these are the following:

1. The *latifolium*, Broad-leaved Water Parsnip, or Skirret, grows in rivers and fens, where it flowers in the months of July and August.....This herb is eaten by horses and hogs, but is disliked by sheep: the roots of this plant are very hurtful to man and cattle; and ought, therefore, to be carefully avoided.

2. The *angustifolium*, Upper Water-Parsnep, or Narrow-leaved Skirret, thrives in ditches and rivulets, where it flowers from July to September....This plant, as Dr. Withering observes, "certainly possesses active properties, which ought to be inquired into;" and Bechstein remarks, that it is not less noxious in its effects than the preceding species.

3. The *nodiflorum*, Creeping or Procumbent Water-Parsnip, grows in rivulets and ditches; flowers in the months of July and August....This plant is very serviceable in diseases of the skin. Dr. Withering cured a child 6 years old of an obstinate cutaneous affection, by administering three large spoonfuls of the juice, twice a day. He likewise gave three or four ounces to adults, every morning, in similar complaints, with the greatest advantage. Its juice is readily taken by children, when mixed with milk; and neither affects the head, the stomach, nor the bowels.

PARTRIDGE, or *Tetrao Perdix*, L. a well-known bird to the sportsmen of Britain. In shape, it resembles a quail, but is of more than double the size; its whole plumage is beautifully variegated, and it has a reddish spot on the breast.

[The partridge of Pennsylvania, and of the States south, is the *Tetrao Marylandus, or Virginianus*, of Linnæus. In the States east of Pennsylvania, the same bird is called Quail. It is found in abundance, from one end of the United States to the other. The male is white under the throat, and has many black feathers on the head. The under part of the female is yellow, and there are fewer black feathers on the head than on the male...The distinction between the quail and partridge, is very trifling.]

PASSION, a term employed to denote an actual degree of desire,

or aversion, prevalent in the human mind, on realizing certain affections.

The influence of the passions on the human frame, is truly astonishing: sometimes they operate suddenly, at others slowly, and almost imperceptibly; but their effects are equally certain. Thus, sudden joy, and long continued sorrow, may become alike fatal; both terminating in death: the phlegmatic and indolent, however, are less subject to their sway than those who possess great sensibility, with an acute understanding.

All violent passions are of dangerous tendency, and not unfrequently lay the foundation of incurable disorders. Hence those, who have any regard for their health, cannot exercise too strict dominion over their passions and affections: and, though the particular mode in which they act upon the human constitution, has not hitherto been determined, yet there doubtless subsists an intimate connexion between the mind and the body; for whatever injures the one, disorders the other.

The inquisitive reader, who wishes to derive information on this interesting subject, will peruse Dr. COGAN'S truly *Philosophical Treatise on the Passions* (8vo. pp. 367, 8*s*. 6*d*. Cadell and Davies, 1800), in which amusement is blended with instruction.

[PASSIFLORA, *incarnata*, L. Maracock May Apple: A native plant of Virginia, and Carolina, growing in cultivated lands, and being a rambling climber, mantles the shrubs, and trails over fences and hedges, exhibiting a fine appearance, decorated with festoons of large blue and purple flowers; which are succeeded by large oval fruit, of the size of small lemons, of an orange colour when ripe, and in taste resemble a China orange. The vines die on the access of frost, but the root being perennial, produces other vines in the succeeding spring. WM. BARTRAM.]

PASTE, denotes a preparation of wheaten flour, boiled up and incorporated with water, till it acquire a viscid consistence. It is used in various trades, as a substitute for *size*, or glue, in pasting or cementing papers, books, &c. If the composition be intended for paper-hangings, or for other purposes where a considerable degree of adhesion is required, one fourth, fifth, or sixth part in weight, of pulverized resin is added; and, if the paste is to be still more tenacious, gum-arabic, or any kind of size, may be dissolved in the liquid, while the mixture is boiling....As this viscous compound, unless it be preserved in a damp place, is apt to dry speedily, it has been recommended to dissolve a little sublimate of mercury (in the proportion of one dram to a quart), in the water employed: thus, it will not only retain its fluidity, but will also be secured from the depredations of rats, mice, and other vermin.

There are, however, various and less expensive vegetable substances, that may be aptly substituted for *flour*; a valuable article, of which considerable quantities are annually consumed for *paste*:....on this and similar occasions, we request the reader to consult the *General Index of Reference*, subjoined to the last volume of this work.

PASTURAGE, or PASTURE, sig-

nifies either the business of feeding tame animals, or such land as is expressly reserved for the grazing of cattle.

Pasture ground is, at present, often preferred to corn-land, on account of the comparatively less labour which it requires; and, because it is erroneously believed, that the manure dropped by the cattle enriches the soil, and thus renders it more profitable, when laid down for grain....Such land is divided into two classes: 1. *Meadows*, which are frequently overflowed; and, 2. *Uplands*, that are considerably more elevated, and consequently dry. The former produce a larger crop of hay than the latter, and do not require to be manured so frequently; but the hay is generally inferior to that obtained from the uplands. The flesh of animals fattened on the latter, is much finer and more delicate than that of such as are fed in rich meadows; the luxuriant herbage of which, remarkably promotes the growth of cattle. On the other hand, *dry pastures* are preferable to meadows; as they afford food during the winter, and are not so apt to *poach* on the return of spring: nor are they so liable to be over-run with weeds: advantages which amply compensate for the smaller crops of hay.

Having already pointed out the profitable nature of MEADOW-land, or that where IRRIGATION is practicable, under those respective heads, we shall proceed to state the more eligible methods of improving upland pasture.

The first measure to be adopted for this purpose is, the division of the land into fields, each comprising four, five, or more acres; to fence the whole with good hedges; and to plant timber-trees at proper distances, in order to shelter the grass from the boisterous vernal winds. The inclosure, however, ought not to be too small, particularly when the hedge rows are to be planted with trees; for, if these be placed too closely together, they will render the grass *sour*, and thus materially injure the pasture.

All weeds infesting the ground, must be carefully eradicated towards the end of summer, previously to their seed-vessels being formed: when sufficiently dry, they ought to be burnt, and their ashes spread on the land before the commencement of the autumnal rains; after which, the surface of the soil should be levelled, and sown with grass-seed that will vegetate the succeeding spring..... Where the surface of the ground is of a cold, clayey nature, it may be improved by PARING and BURNING; but, if it be hot and sandy, it will be necessary to apply considerable quantities of chalk, clay, marle, or lime. Every mole-hill should likewise be pared, burnt, and the ashes immediately scattered over the land; though it will be advisable to sow the bare spots with grass-seeds, shortly before the rains of autumn.

The next operation is that of levelling the surface with a heavy wooden roller, in the month of February or March, during moist weather; in consequence of which, the grass will vegetate more luxuriantly, and the growth of weeds will be counteracted.

In laying down land for *pasture*, the greatest attention is requisite in the selection of seeds: the best

for this purpose are, the finest upland hay-seeds, and the White or Dutch Clover. If the former be sifted from all extraneous substances, three bushels will be fully sufficient for an acre of land: of the latter, eight pounds will be necessary, which ought to be sown after the hay-seeds; because the clover, being considerably heavier than these, will otherwise sink to the bottom; and its distribution in the ground will be irregular.

When the first grass appears, all weeds must be speedily eradicated; as they will otherwise impede its growth; and, if suffered to stand till they shed their seed, the land will be so completely over-run, that the herbage will be totally suppressed.

Various methods are practised with a view to enrich pastures, and to promote the growth of the grass. Among these, *rolling* the ground two or three times, at proper intervals, during the spring, has been found very beneficial; for it compresses the grass, which thus acquires a thicker *bottom*: and the clover striking roots from every branch in contact with the ground, they will be matted so closely together, as to form a beautiful thick sward, that will cover the whole surface of the land, and flourish during the severest droughts..... Some graziers turn a few sheep, and one or two colts, into each pasture; which practice is very successful; for the sheep eat down and destroy the rag-wort (*Senecio Jacobæa*, L.) which vitiates many of our best pastures, where oxen only are fed.

New pasture-land may be advantageously stocked with sheep; because those animals will partially check the luxuriance of the grass; in consequence of which, the latter will unite, or *mat*, at the bottom; and thus produce a tender herbage for cattle....Pastures may likewise be materially improved, by alternately mowing and feeding off the crops.

In the counties of Cardigan and York, an excellent practice prevails, which, if it were more generally known, would be the means of ameliorating poor or indifferent pasture-grounds. The farmers *put up* such lands as early as possible in the month of May, for the summer season; during which they pay no other attention, than to eradicate docks, to destroy thistles, &c. In this state, the ground remains till December, when all the stock is turned in, and every animal will be in excellent condition, without the aid of hay, straw, or oats; while the milk, or butter, in all respects becomes equal to that produced at any other period of the year. The grass is sweetened by the frost, and remains uninjured by the snow; but, while the latter covers the ground, it will be necessary to resort to dry food. In the spring, young shoots of grass will burst forth beneath the shelter of the old ones, and both are eaten with avidity. By this practice, land formerly infested with moss, in consequence of its having been over-stocked and grazed *too bare*, will soon be covered with palatable herbage; and the moss disappear without the aid of the plough, or of any *surface-manure*.

For a comparative view of the advantages and disadvantages of *pasturing* and *soiling* cattle, the reader is referred to p. 37 of our 2d volume. See also GRASS, and MEADOW.

PATENTS, or LETTERS PATENT, are privileges obtained from government, in order to convey the title, property, and exclusive right to an invention, discovery, or peculiar establishment, &c.

Letters Patent are usually granted for the term of 14 years, upon condition that the patentee specify his invention or improvement, in such a manner that the public may receive the benefit of it, and may be at liberty to practise or employ such contrivance at the expiration of the exclusive privilege.

[The law of the United States respecting patents requires some alterations which it may be well here briefly to state.

1. Patents should be granted to foreigners as well as to citizens.... The present restriction of our protection to the genius of the latter, is not only illiberal, but highly detrimental to the country, by preventing many ingenious men from divulging their discoveries as soon as they come among us. By pursuing an opposite system, England has become the depot of the inventions and discoveries of all Europe and America: and hence her arts and manufactures have arrived at a degree of perfection, of which no other country can boast.

2. Inventors and discoverers applying for patents, ought to be obliged to secure to the country the advantage of their discoveries, by entering into an obligation to erect or make for sale all their inventions, or to impart a knowledge of them for a reasonable reward: as it is known that many persons are so selfish, as neither to make use of them, nor to grant to others that liberty, unless at an extravagant price, far beyond what the value of the invention would warrant.

3. Some tribunal should be established to determine upon the right which persons may possess to obtain a patent. It is a fact well known, that several persons have obtained patents from the government of the United States, for *supposed* discoveries and inventions which have been long known, or in use in Europe; some of these are noticed in this Encyclopædia, and more plagiaries might doubtless be detected, if a list of all the patents were published, which have been granted in the United States.

4. Provision should be made for making void the claim of any patentee, as in England, if not supported by originality, or if he wilfully give a confused and erroneous specification.]

PEA, or *Pisum*, L. a genus of leguminous plants, consisting of 4 species; of which the following are the principal:

1. The *maritimum*, or SEA-PEA, is a native of Britain; growing on the sea-coasts, and flowering in the month of July or August. It is eaten by horses, cows, sheep, and goats.

2. The *sativum*, or COMMON PEA, which has long been cultivated in this country. There are two sorts of this species, known by the names of *Grey*, or *Hog-Pea*, and of the *Common*, or *Garden-Pea*. The latter is again divided into many varieties, of which gardeners enumerate not less than thirty; but we shall only state the names of those which amply repay the labour and expence of cultivation; namely, the *Grey Hog-Pea*; the *Common White Boiling-Pea*; the

Charlton (or, *forty-day*) *Hot-spur*; the *Rounceval*, *Blue*, *Large Grey*, and *Speckled Pease*.

All these varieties delight in dry warm soils, though the blue pea will also succeed on poor land. They are raised from seed, which is sown from the middle of February to the middle of April, in the proportion of from three to five bushels per acre, broad-cast; but, if drilled, two bushels will be fully sufficient. When they are sown broad-cast, the ground is usually harrowed, to protect the seed from the depredations of birds; but the drilled pease are earthed up, and weeded twice; the first time, when they are about an inch above the ground; and secondly, when they attain the height of about four inches.

No sooner do pease arrive at maturity, than they are attacked and devoured by rooks, wood-pigeons, and other birds: hence, it will be necessary to watch them with care: and, after cutting, or *hacking* them, as it is provincially termed, they should be formed into small *wads*, or bundles, and exposed for some days, so that the straw may wither, and the fruit become dry.

Beside their utility for culinary purposes, pease, when *harvested dry*, and ground into meal, are uncommonly serviceable for fattening hogs; as no other grain agrees better with those animals. If the straw be forward in autumn, and has been housed without injury, it will be little inferior to ordinary hay, and afford a very useful article of fodder; on which every kind of cattle will thrive: and, though it be apt to occasion gripes in horses, if given to them before the month of January, yet such effects may be corrected, by allowing a few turnips, cabbages, or potatoes, either with, or after they have eaten the pea-straw.

A crop of pease is so far from exhausting the land, that it may be considered as an excellent and ameliorating manure. Thus, *grey-pease*, in particular, if sown towards the end of March, and ploughed in shortly before they flower, will prove a valuable dressing for wheat. Hence, likewise, if the *Charlton or forty-day Pea* be sown early in the same month, the crop may be cleared off the field towards the end of June, or early in July; so that it will become an excellent preparation for turnips. Should the harvest, however, be later, the *wads* ought to be laid in rows, and the intermediate spaces ploughed without delay; by which practice the soil will not only be cleared from weeds, but at the same time be materially improved; the surface being rendered more loose and friable in consequence of the putrefactive fermentation beneath the pease; which exclude the rays of the sun, and retain moisture. In this manner, the culture of pease is not only a source of profit, but also saves labour in tillage; the turnips being sown after a single ploughing, which cannot be effected by any other crop.

Such is the method in which pease are cultivated for general use; but, in order to obtain them at an early season, the gardeners in the vicinity of the metropolis, raise them on hot-beds. For this purpose, they sow the *Dwarf-Pea*, about the middle of October, in warm borders contiguous to walls or hedges: when the plants ap-

pear, they are gently *earthed up*, to protect them from frost. During the severer parts of the winter, they are covered with pease-haulm, straw, or other light shelter, and occasionally earthed as they advance in size. Towards the end of January, or early in February, they are removed to a hot bed, and afterwards sparingly watered till the fruit begin to appear; being also screened with mats from the intense heat of the meridian sun.

In order to obtain a regular supply for the table, the gardeners in a similar manner cultivate the *Charlton*, or forty-day pea, *Golden Hot-spur*, or the *Master* and *Reading-Hot-spurs*, which afford crops in succession. The greatest care, however, is necessary to clear them from weeds in the spring, and also from vermin, which will otherwise destroy the whole produce. Their most formidable enemies are slugs, which particularly infest wet soils, or such gardens as are over-run with weeds. These insects conceal themselves during the day in small cavities under ground, and come forth in the night, when they do extensive mischief. With a view to check such devastations, it will be advisable, first to clear the land around the plants, then to destroy their recesses, and next to scatter a little slaked lime over the ground, very early in the morning, when the vermin are in motion. By this simple expedient, they will be effectually exterminated, without any injury to the pease, provided the lime be not too thickly spread over the plants.

In common with all other leguminous fruits, pease possess a strong mucilage, with an earthy basis, and yield a very solid nourishment to persons of vigorous stomachs; but, as *pulse* of every description evolves a considerable portion of fixed air within the bowels, it is apt to excite flatulency and costiveness, if eaten too frequently, or in too large quantities. On the other hand, pease boiled in a fresh, or green state, are equally wholesome and agreeable; being less flatulent, and more easily digested, than after they have attained to maturity. *Bread* formed and baked, of pease alone, is remarkably solid, heavy, and unwholesome. Beckmann informs us, that such bread, while new, had an agreeable taste, but was productive of hoarseness and sore-throats. Experience, however, has evinced, that three parts of rye-flour, and one of ground pease, afford a palatable and more nourishing bread, than that made of wheat or rye alone.

[*To raise Peas late in Autumn, and method of preventing Mice eating them when sown*, by M. R. Weston, Leicester, *Repl. of Arts* vol. 1. new series.

"Of all the peas" I have tried for a late crop in autumn, the purple flowered field peas, answer the best, as they are not so liable to be mildewed as many of the other sorts, and will continue flowering till the frost stops them.

These peas may be sown in July, August, or so late as the first week in September; if sown in a warm sheltered situation, and on a soil inclining to sand.

Soak the peas in warm milk; and after you have drawn the drills, water them before you sow the peas; it is best to sow them to-

wards the evening. If the Autumn should prove very dry, they will require frequent watering.

When peas are sown before winter, or early in spring, they are very apt to be eaten by mice.

To prevent this, soak the peas for a day or two in train oil, before you sow them, which will encourage their vegetation, and render them so obnoxious to the mice, that they will not eat them.

The advantage of sowing peas *in circles, instead of straight rows.*

It is a great error in those persons who sow the rows of tall growing peas close together. It is much better in all those sorts which grow six or eight feet high, to have only one row, and then leave a bed ten or twelve feet wide for onions, carrots, or any crops which do not grow tall.

The advantages which will be derived are, that the peas will not be drawn up so much; be stronger; will flower much nearer the ground, and in wet weather, can be more easily gathered without wetting yourself.

But instead of sowing peas in straight rows, if you will form the ground into circles of three feet diameter, with a space of two feet between each circle, in a row thirty feet long, you will have six circles of peas, each nine feet; in all fifty four feet of peas, instead of thirty, on the same extent of ground.

If you want more than one row of circles, leave a bed of ten or twelve feet before you begin another.

For the very tall sorts, four feet circles will afford more room for the roots to grow in, and care must be taken, by applying some slender twigs, or strings, to prevent the circles from joining each other.

This method is equally applicable to scarlet beans."

Green peas are much infested by a fly (*bruchus Pisi*) which lays its eggs in the pods. It is particularly busy in this work during night, and when the weather is cloudy.

Dr. ANDERSON says, that lime is the best manure for land intended to be sown with peas.]

PEA, the HEATH, or PEASLING; *Orobus tuberosus*, L. an indigenous perennial plant, growing on moist heaths and in woody meadows; flowering in the months of April and May.

This hardy vegetable may be easily propagated, either by parting the roots, or sowing the seeds in autumn; and prospers in any common garden soil. Its root has a sweet taste, similar to that of liquorice; is highly nutritious when boiled; and has, in times of scarcity, served as a substitute for bread. It is likewise held in great esteem by the Highlanders of Scotland, who chew it like tobacco; and assert, that it obviates the uneasy sensation of hunger. In the counties of Breadalbane and Ross, the inhabitants bruise and steep the roots of the heath-pea in water, from which they brew an agreeable, though intoxicating, liquor. In medicine, they are employed to promote expectoration, and supposed to be very efficacious in pulmonary complaints. The herb is relished by horses, cows, goats, and sheep.

PEA, the NARROW-LEAVED EVERLASTING, or VETCHLING, *Lathyrus sylvestris*, L. an indigenous perennial plant, growing in woods and hedges, chiefly in the south-western counties of England; and flowering in the months of

July and August. This winding herb is well-calculated for arbours: its red blossoms are beautifully veined, and eagerly visited by bees; though the plant itself is said to be noxious to sheep.

PEACH-TREE, or *Amygdalus Persica*, L. a well-known exotic fruit, originally brought by the Romans from Persia to Italy.

There are numerous varieties of this tree, cultivated on account of their delicious fruit; the principal of which having already been stated in the article ORCHARD, pp. 192, &c. of the present volume, we subjoin the following, in order to complete the catalogue of this valuable production.

1. The White Nutmeg; 2. The Red Nutmeg; 3. The Early Purple; 4. The Small Mignon; 5. The Yellow Alberge; 6. The Beautiful Chevreuse; 7. Smith's Early Newington; 8. The Montauban; 9. The Vineuse; 10. The Bourdine; 11. The Rossanna; 12. The Old Newington; 13. The Royal; 14. The Rambouillet; 15. The Portugal; 16. The late Admirable; 17. The Nivette; 18. Venus's Nipple; 19. The late Purple; 20. The Persique; 21. The Catharine; 22. The Royal Anne; and 23. Bloody Peach.

On the Continent of Europe, these trees, as well as NECTARINES, are propagated by planting the stones of the fruit in autumn, in beds of light, rich earth, where they remain for a whole year, being sheltered from the severity of winter. Next, they are removed into nurseries, where they grow for two or three years, till they are finally transplanted to the spot of their destination. In Britain, however, this practice seldom succeeds; the peaches are therefore propagated by inoculating them in the month of August (if *single blossomed*), into the *St. Julian Magnum*, *Gage*, or other free growing plumb-stocks; or (if *double-blossomed*), into the Muscle-plum.

The stocks ought to be planted first in the nursery, when they do not exceed the size of a straw; and, in the course of one or two summers, they will be ready for the reception of the bud. The INOCULATION, which is to be performed in the usual manner, seldom fails, provided it be carefully managed.

["Peach-trees are liable to three casualties:

1. The fly, that deposits its egg near the root, and there forms a worm.

2. The bursting of the bark by severe frost in wet winters.

3. The splitting off the limbs at the fork of the tree.

The fly which is blue, (but not a wasp,) begins its attack about the middle of July, and continues its depredations until the middle of September. It wounds the tender part of the bark, and *generally* at the surface of the ground, there depositing its eggs, which hatch into worms, that prey upon the mucilage and tender part of the bark; until the communication between the root and the branches is cut off, causing the death of the tree. To guard against this, raise a little hillock in the month of June, round the tree, about a foot high, so as completely to cover that part of the bark kept moist and tender at the surface of the ground. This hillock will not stand so long at one height, as to tender the bark above, as the rain will gradually wash it

down level with the surface, and must be raised again every summer."

To take out the worm, the roots must be uncovered, and the spot looked for where the gum ooses out, follow the cavity round with the point of a knife, until you come to the solid wood, and lay the whole open: the worm will be found with a white body and black head; which must be destroyed, and the holes carefully filled up with cow-manure rendered adhesive by sand or lime core and ashes, as directed by FORSYTHE.

Soap-suds heated after a family wash, and poured on the roots of the trees about the middle of August, has been used with success in destroying the eggs, or the young worm.

According to Mr. JOHN ELLIS of New-Jersey, the injury arising from the worm may be prevented in the following way:

In the spring, when the blossoms are out, clear away the dirt so as to expose the root of the tree, to the depth of three inches; surround the tree with straw about three feet long, applied lengthwise, so that it may have a covering, one inch thick, which extends to the bottom of the hole, the butt ends of the straw resting upon the ground at the bottom....bind this straw round the tree with three bands, one near the top, one at the middle, and the third at the surface of the earth, then fill up the hole at the root, with earth, and press it closely round the straw. When the white frosts appear, the straw should be removed, and the tree remain uncovered until the blossoms put out in the spring.

By this process the fly is prevented from depositing its egg within three feet of the root, and although it may place the egg above that distance, the worm travels so slow that it cannot reach the ground before frost, and therefore is killed before it is able to injure the tree.

"The truth of the principle is proved by the following fact. I practised this method with a large number of peach-trees, and they flourished remarkably, without any appearance of injury from the worm, for several years, when I was induced to discontinue the straw with about twenty of them.... *all those which are without the straw have declined, while the others which have had the straw, continue as vigorous as ever.*" Thus far Mr. E.

"To guard against frost, plant the trees where the water will run off, and procure the sweetest and richest fruit, as the inferior qualities are more injured by cold.

"The splitting of the tree at the forks, is guarded against by preserving as many upright branches as can be spared, by breaking off in bearing years, more than half the quantity of fruit while small, and by pruning almost the whole of every branch beyond where the fruit is set, leaving only a few buds on each of the succeeding year's fruit. The size of the fruit is by these means rendered larger, more beautiful, and of a higher flavour, and the growth of the tree is rendered more vigorous."

Mr. THOMAS COULTER of Bedford county, Pennsylvania, gives the following directions for cultivating peach-trees, which he has successfully pursued in Pennsylvania and Delaware, for 45 years.... See *Trans. Amer. Phil. Soc.* vol. 5.

"The principal causes of peach-trees dying whilst young, are the

planting, transplanting, and pruning the *same stock*; which causes the stock to be open and tender, and the bark of the tree very rough: this roughness of the bark gives opportunities to insects to lodge and breed in it; and birds search after these insects, for their support; and with their sharp bills, wound the stock in many places; from which wound the sap of the tree is drawn out, which congeals, and never fails to kill, or to render the tree useless in a few years. To prevent which, transplant your peach-trees, as young as possible, where you mean them to stand; if, in the kernel, so much the better....because, in that case, there will be no check of growth, which always injures peach-trees. Plant peach-trees 16 feet apart, both ways, except you would wish to take your waggon through the orchard to carry the peaches away; in that case, give 24 feet distance to every fifth row, one way, after transplanting. You may plough and harrow amongst your peach-trees, for two years, paying no regard to wounding or tearing them, so that you do not take them up by the roots. In the month of March, or April, in the third year after transplanting, *cut them all off by the ground;* plough and harrow amongst them as before, taking special care not to wound or tear them in the smallest degree, letting all the sprouts or scions grow that will grow; cut none away, supposing six or more should come from the old stump; the young scions will grow up to bearing trees on account of the roots being strong. Let no kind of beasts into peach-orchards, *hogs excepted*, for fear of wounding the trees; as the least wound will greatly injure the tree, by draining away that substance which is the life thereof; although the tree may live many years, the produce is not so great, neither is the fruit so good. After the old stock is cut away, the third year after transplanting, the sprouts or scions will grow up, all round the old stump, from four to six in number: no more will come to maturity, than the old stump can support and nourish; the remainder will die before ever they bear fruit. These may be cut away, taking care not to wound any part of any stock, or the bark. The sprouts growing all round the old stump, when loaded with fruit, will bend and rest on the ground in every direction, without injuring any of them, for many years, all of them being rooted in the ground, as tho' they had been planted. The stocks will remain tough, and the bark smooth for 20 years and upwards; if any of the sprouts or trees from the old stump should happen to split off, or die, cut them away, they will be supplied from the ground, by young trees, so that you will have trees from the same stump for 100 years, as I believe. I now have trees 36, 20, 10, 5, and down to one year old, all from the same stump. The young trees coming up, after any of the old trees split off or die, and are cut away, will bear fruit the second year; but this fruit will not ripen so easily as the fruit on the old trees from the same stem. Three years after the trees are cut off by the ground, they will be sufficiently large and bushy, to shade the ground so as to prevent grass of any kind from matting or binding the surface, so as to injure the trees; therefore, ploughing is useless, as well as injurious; useless,

because nothing can be raised in the orchard, by reason the trees will shade all the ground, or nearly so; injurious, because either the roots, stock or branches will be wounded: neither is it necessary ever to manure peach-trees, as manured trees will always produce less and worse fruit, than trees that are not manured; although by manuring your peach-trees, they will grow larger, and look greener and thicker in the boughs, and cause a thicker shade, yet on them will grow very little fruit, and that little will be of a very bad kind....generally looking as green as the leaves, even when ripe, and later than those that never have been manured*.

"Peach-trees never require a rich soil; the poorer the soil the better the fruit....a middling soil produces a more bountiful crop.

"The highest ground, and the *north* side of hills is the best for peach-trees; they keep back vegetation, by which means the fruit is often preserved from being killed by late frosts in the month of April, in the Pennsylvania latitude. ....I have made these observations from actual experience.

"A gentleman from Monongahela county, in Virginia, called at my house, and asked me who instructed me to cultivate peach-trees: I told him that observation and experience were my teachers. The gentleman observed that Col. LUTHER MARTIN, in the lower parts of Maryland, and another gentleman near the same place, whose name he could not recollect, were pursuing the same plan advantageously."

The propriety of transplanting trees, was explained in vol. ii. p. 96–7.

The practice of Mr. COULTER, in cutting down the trees, is highly rational: they are thus forced to spend their vigour upon their bodies and roots, instead of shooting up into the air with thin barks, which are easily penetrated by the fly.

The best kind of peaches is said to be produced from inoculation; and upon an *apricot stock*, as they are not liable to be injured by the fly; and that peach-trees thus produced, grow larger and rise higher, than when on the peach-stock..... Grafting the peach upon a plumb-stock, has also been practised, with a view of resisting the attack of the fly; but this operation must be performed under ground, otherwise an unsightly knob will be the consequence of the peach-tree overgrowing the plumb-stock, and endanger the breaking off of the tree, at the place of junction.

The directions given by FORSYTHE, with respect to wall peach-trees, may be applied to our standard trees, viz. To pinch off all the strong shoots in June, the first year the tree bears; which will make them throw out side-shoots: these, if not laid too thick, will make fine bearing wood for the succeeding year. If the strong shoots be suffered to grow to their full length, they will be large and spongy, and will neither produce good fruit nor good wood for the following year. Sometimes weakly trees are covered with blossoms, but if too much fruit be suffered to remain on them, they will be weakened so much that they will never

* This direction is directly contrary to the experience of a gentleman mentioned in *P.* 175. *Edit.*

recover. In that case, I would recommend picking off the greater part of the fruit, to let the tree recover its strength. When trees in this state are pruned, never prune at a *single flower-bud;* as the shoot will be either entirely killed, or at least die, as far as the next wood-bud.

"I have often topped the strong shoots twice in the course of a summer, before they produced the fine kind-bearing wood. These strong shoots exhaust the tree, and never produce good wood when neglected to be topped. I would recommend to cut out such shoots when the trees are pruned in the spring, and to leave only the bearing wood, which may be known by two small leaves where the flower-buds will be in the following year: (the strong shoots having only one leaf-bud at each eye) and to pick off all side-shoots near the tops of the branches, as soon as they can be laid hold of."

Peaches yield, on distillation, a highly flavoured spirit, which is deservedly much prized. One or two spoonfuls added to a bowl of common punch, greatly improves it. Indeed, it is difficult to find a more agreeable assuager of thirst, than such a combination.]

The flowers of peaches emit an agreeable fragrant odour, and have a bitterish taste. If distilled in a water-bath, they yield a whitish liquor, about one-sixth part of their weight; and which communicates to a large quantity of other liquids, a flavour similar to that of the kernels themselves....An infusion of half an ounce of the fresh-gathered flowers, or a dram of them when dried, in half a pint of boiling water, sweetened with a little sugar, is said to be an useful laxative, and vermifuge, for children,

PEAR-TREE, or *Pyrus communis*, L. a valuable indigenous tree, growing in woods and hedges, in various parts of Britain; and flowering in the months of April and May.

The pear-tree delights in rich soils and gentle declivities; but will not thrive in moist situations It resists the severest frosts; its wood is smooth, light, and compact; and is used in considerable quantities by turners, for making carpenter's or joiner's tools, and for picture-frames, which are stained black, in imitation of ebony. The leaves impart a yellow dye, and are sometimes employed to communicate a green colour to blue cloth:.....they are eaten by horses, cows, sheep, and goats.

In a wild state, the fruit of the pear-tree has an austere and unpleasant taste; but, when cultivated; it is highly grateful; and skilful gardeners have obtained not less than 1500 varieties, by inoculating, inarching, engrafting, &c. the common wild stock, with scions of other fruit-bearing trees. ....The most valuable of these, whether for the dessert, or for culinary purposes, we have already specified, under the article ORCHARD and shall therefore confine our account to the best method of rearing them, and to a concise view of their properties.

All the varieties of this tree are hardy, and will succeed in any common garden-soil, provided it be open and dry. They are propagated by engrafting, and by budding, or inoculating either upon *free* stocks, that is, such as have been raised from seed, or upon quince-stocks: the latter, however,

requires a rich and moist soil. Sometimes the scions are engrafted on medlars, in order to render them dwarfs; and nursery-men have also ventured to *bud* them on white or hawthorns, when there has been a scarcity of original or free-stocks. But such practice ought to be adopted only in cases of real necessity; as it renders the fruit *stony*, and otherwise diminishes its value. The relative salubrity of pears depends not less on the state of ripeness, or immaturity, in which they are used, than on their different properties; some of them being hard, astringent, and difficult of digestion..... The more juicy ones, however, possess a saccharine fluid, which does not oppress the stomach: nevertheless, all the varieties are more flatulent than apples, plums, or the generality of fruit; and winter-pears are particularly liable to such inconvenience; as they are commonly eaten at a period of the year, when the stomach requires stimulating, rather than cooling, nourishment.

Independently of their utility for domestic or culinary purposes, pears (if managed in a similar manner with apples for making CYDER) afford a pleasant liquor, known under the name of *Perry*. The best fruits for this purpose are those of Bosbury and Bareland, in the county of Worcester, and the Squash-Pear, as it is termed in Gloucestershire; to which may be added the varieties known under the names of the *John*, *Harpary*, *Drake*, *Lullum*, and *Horse Pears*. All these, being reared in hedges, are so extremely harsh and tart, that no person can eat them in a fresh state; and they are refused even by hogs.

PEARL, a hard, white, glossy, and roundish concretion, which is usually found in the shell of the East-India pearl-oysters; though it is also occasionally met with in the shell-fish of Europe.....About the middle of the last century, a very extensive fishery was carried on, in the rivers communicating with lakes in the northern parts of Scotland; whence London was supplied with a considerable number of pearls, that were little inferior to those of the East; but this source of wealth is at present exhausted.

Pearls are formed of the same matter as the inner shell of the fish in which they are found; and consist of several coats spread with the greatest regularity over each other, in a manner similar to those of an onion. The most esteemed and *true* form of pearls is, a complete sphere; though they are sometimes pear-shaped, and of a considerable size, according to which their value rises progressively; as they serve for ear-rings, and other ornaments. They ought to possess a pure white lustre, perfectly clear from spots or stains; and their surface should be smooth and glossy; having a beautiful natural polish, which no art can improve....The finest pearls are imported from the East; and, like rubies, &c. may be brought to England from any place, and in any ships, free from all duty.

Artificial Pearls:....As the genuine pearls are sold at an extravagant price, ingenious men have contrived methods of imitating them so completely, that they can scarcely be distinguished from those collected in the East. The principal ingredient, employed

for this purpose, remained a profound secret for many years; but it is now ascertained, that it consists of the fine silvery matter, which is found on the lower side of the scales of the blay, or bleak-fish (*Cyprinus alburnus*, L.). These scales are first removed; then washed repeatedly in pure water; and, after the different liquors have subsided the fluid part is carefully decanted; when a pearly matter, of an oily consistence, remains at the bottom; which is denominated by the French, *Essence d'orient*. A small portion of this matter is dropped in a hollow, blueish glass-bead, that is gently agitated, till the whole internal surface is completely lined; when the cavity is filled up with wax, in order to impart solidity and weight. Pearls thus manufactured, possess fewer blemishes than such as are natural or genuine, to which they are fully equal, in point of brilliancy.

PEARL-ASH, a kind of fixed alkaline salt, prepared in various parts of Europe, and also in America, by melting and extracting the salts from the ashes of burnt vegetables; and, after evaporating the moisture, and reducing them to dryness, by calcining such ashes for a considerable time in a furnace moderately heated.....See ALKALIES.

The best *pearl-ashes* are obtained from weeds, the ashes of which yield a larger proportion of salt than most kinds of wood. And it appears from the numerous experiments of Mr. KIRWAN, that among weeds, the FUMITORY produces the greatest quantity of salt; and next to it, WORMWOOD; though he observes, that if we attend only to the proportion of salt in a given weight of ashes, those of wormwood contain the most....The Trefoil-BUCKBEAN (*Menyanthes trifoliata*, L.)also produces a larger quantity of ashes, and salt, than fern.

Pure pearl-ashes should possess a very acrid, caustic taste, and be uniformly *white*; though such criterion is not always to be relied upon, as they are frequently adulterated with lime and salt; impositions, not easily discovered by the eye. In order to detect this fraud, let a small portion of the suspected pearl-ash be exposed to the air till it becomes soft, when it should be held over the fire in a shovel: if the alkali contain any common salt, the latter will crackle, and a slight explosion will take place, as soon as it becomes hot.

Pearl-ashes are very generally employed in the manufacture of glass; for they combine with earths in a proper degree of heat, and form a vitreous mass: they are also used for domestic purposes in washing linen.

In 1791, a patent was granted to Mr. GEORGE GLENNY, for his method of obtaining a larger proportion of *pearl* and *pot-ashes* from those of wood, than that which is usually procured....The patentee's process consists in calcining the common wood-ashes in a furnace; previously to which, a small quantity of lime is to be sifted among them, to prevent the mass from vitrefying; though, if the latter be continually stirred during the process of calcination, the addition of lime will be unnecessary. When the ashes are calcined into a fine powder, they may be treated in the usual manner; but he observes,

that it will be better to boil them in large vessels, especially during frosty weather. [See POTASH.]

PEARLWORT, the PROCUMBENT, TRAILING PEARLWORT, or BREAK-STONE, *Sagina procumbens*, L. an indigenous perennial plant, growing on walls; in sandy and boggy situations; in garden-walks, and paved courts: it flowers from May to August.....This elegant herb is one of the smallest productions of the vegetable kingdom: its thread-like stem divides itself into many branches; the leaves are slender and minute; the blossoms greenish-white; and the whole plant scarcely exceeds two inches in height.

PEAT, a well-known inflammable fossil, which is used in various parts of the world as fuel. There are two species of this remarkable substance:

1. A *yellowish-brown peat* found in Scotland, Holland, and Germany. It is composed, according to Mr. KIRWAN, of clay, mixed with calcareous earth and pyrites, and sometimes contains a portion of common salt. When fresh, it is of a viscid consistence, but hardens by exposure to the air; and, after separating the calcareous and stony matters, it is cut while soft, into oblong pieces, and thus sold for fuel.

2. Another species of a *dark-brown* colour, is dug up near Newbury, in the county of Berks, and consists of the branches, twigs, leaves, and roots of trees, together with grass, straw, plants, and weeds; which, after having lain for a long time in water, are converted into a soft mass, that may be cut through with a sharp spade. It is also principally employed as a substitute for sea-coal, or wood.

Independently of its utility as *fuel*, the ashes of peat afford a valuable manure. We have already stated, in articles ASHES and MANURES, the soils as well as the manner, in which they may be most beneficially employed.....For an ingenious and practical method of cultivating *peat-mosses*, see the article MOSS-LAND.

[Inert vegetable matter or peat, is for the most part formed of the remains of vegetables in humid situations. It is very retentive of moisture, and inflammable. In peat-mosses there are frequently springs of mineral waters, which contain saline and ferruginous matters..... Hence the ashes of peat, besides the earthy matter, (consisting for the most part of phosphat of lime) contain likewise phosphat of iron, gypsum, epsom salt, and green vitriol: and hence their different effects, when used as manures.

Peat soils, which acquire an unctuous, rich clamminess, by the application and action of dung, urine, and alkaline salts, are according to Lord DUNDONALD, the fittest for the growth of hemp. The culture of this plant would be a source of employment in the winter, and would furnish an internal, or home supply of an article so indispensably necessary to a maritime state. The oil of the seed might be employed to make soap, superior to that made from tallow; for which purpose it is imported into Britain from Russia.

Shell-marl is frequently found under peat mosses; they should therefore be bored in different places, to ascertain if they possess this valuable substance.

Improved peat mosses, are productive of luxurient vegetation..... They should be dedicated to pas-

ture, and only ploughed when, notwithstanding the utmost endeavours, the ground produces coarse, rank grass; but this may be prevented by due attention to the following directions:

1. To keeping the water in the ditches at a proper level.

2. To stocking the ground with a due proportion of cattle, sheep and horses.

3. To folding cattle on different parts of each field.

4. To using heavy rollers.

5. To top dressing, with alkaline salts, and other saline substances, lime either by itself, or when mixed with peat or fen mould.]

PEAT-BORER.....In the 19th. vol. of the "*Transactions of the Society for the Ecouragement of Arts*," &c. we meet with a description of an implement contrived by THOMAS ECCLESTON, Esq. of Scarcebrick-hall, Lancashire. It is denominated a *Peat-borer*, and is designed for draining boggy land: as its application has been attended with uncommon success, we have given an engraved figure representing its construction.

Description of Mr. ECCLESTON'S *Peat-borer.*

(See PLATE I.)

A, is the cutter of the borer, which penetrates the peat.

B, is the body of the borer, six inches in diameter.

C, the aperture, through which the peat, introduced by boring, is extracted from the ground.

D, represents a portion of the iron bar of the borer; to the upper part of which a cross handle is to be affixed.

It frequently happens, that the bottoms of drains and ditches, when newly cut, rise so considerably from the pressure of the subjacent waters, as to be nearly filled up, and consequently to impede the course of that fluid which they were intended to carry off; so that the work is rendered ineffectual.... To prevent such accidents, recourse is generally had to a common auger, or even to a pole, which procures a temporary passage for the water; but, the peat being thus pressed only in a lateral direction, *without being cut*, the sides speedily close; and the course of the fluid again becomes obstructed. Mr. ECCLESTON'S implement, therefore, is calculated to remove such impediment; for by means of his auger, a cylindrical column of peat, six inches in diameter, will be completely cut out and removed; thus affording a free passage to the confined water, for a considerable length of time. Hence, the expence of draining boggy lands may be considerably reduced; and they will eventually be rendered so firm, that the first drains will stand unimpaired.

The proper depth to which the peat-borer should descend, must be regulated by the situation of the soil.....where moss-lands are very *low*, and liable to be inundated, it will be advisable to penetrate only to such a depth as will be sufficient to drain the surface; because deep boring would cause it to sink so low, as to be overflown by every sudden shower of rain.

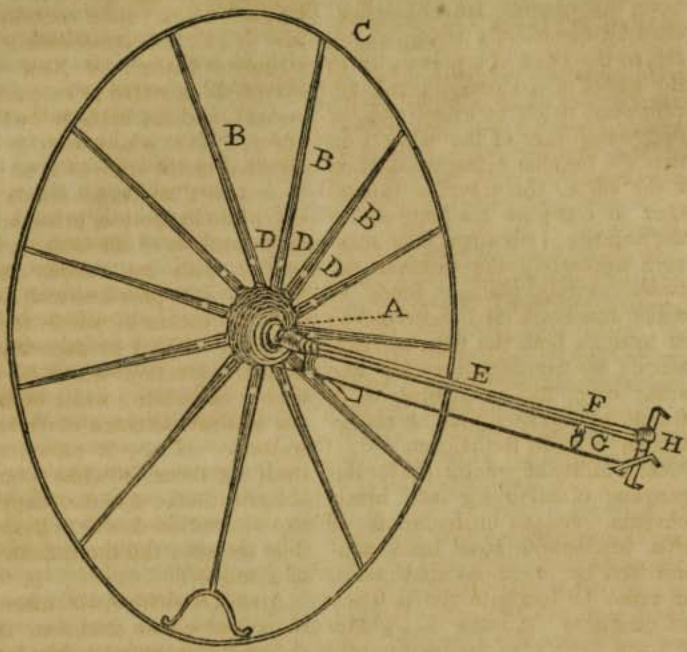
PEDOMETER, or PODOMETER, a contrivance for measuring distances, which is usually constructed in the form of a watch, and consists of several wheels with teeth, that are arranged in the same plane

and correspond with each other.... Such instruments are either fastened by means of a string, chain, &c. to the knee of a person, or to the wheel of a carriage; and advance one notch at every step, or each revolution of the wheel; so that the number being marked on a dial-plate, the traveller is enabled to compute his progress by the number of his steps, or to measure accurately the distance between certain places. Some of these machines are contrived so as to mark both the time and distance; by combining within the same case, the mechanism of a watch, so that they may be conveniently worn in the pocket.

The utility of pedometers for the purpose of *surveying land* being obvious, various instruments of this description have been constructed by ingenious mechanics, in order to facilitate the practice of geometry. Among these, Mr. EDGEWORTH's late contrivance deserves to be first mentioned, on account of its great simplicity; but as it is calculated only for *level* grounds, and is apt to be deranged by hilly or irregular surfaces, we decline to enter into any detail.

A pedometer, upon a new plan, was a few years since contrived by Mr. W. FRASER, mathematical instrument maker, of New Bond Street. It is stated to be perfectly correct, and not liable to be out of order. The wheel-work is constructed on the scale of 1000 paces to a mile; and, as it winds itself up, while in motion, being adjusted to pockets of all sizes, it is attended with no trouble to the wearer. It is provided with a compass, by means of which the traveller is enabled to ascertain the different directions which he takes on his excursion; while he learns the accurate distance which he has walked. Hence it recommends itself to those invalids, who are obliged to take a certain degree of exercise within doors; as they may thus measure the thousandth part of a mile.

Another machine, which deserves more immediate attention, is the pedometer invented by Mr. LEWIN TUGWELL, of Beverstone, in the county of Gloucester, and which is represented in the following Cut:



A, The stock of the pedometer.

B, B, B, &c. Twelve spokes; one end of which is fastened by means of a screw to the outward ring, or periphery of the wheel, while the other is inserted in the stock.

C, The periphery, which is an iron ring 16½ feet, or one pole in circumference; and which is divided into 25 equal parts, corresponding to the links of Gunter's chain for land-measuring, &c.

D, D, D, &c. Are twelve small plates, representing the separate spokes, and each of which includes two links of the chain above-mentioned; the twelfth spoke being divided at its foot, for comprehending the 25th link.

E, An iron axis, being a screw with 320 circumvolutions, each of which is marked separately on an engraved index on one of its sides: and, in order to apply this part of the machine, it is screwed firmly into the stock of the wheel, with which it revolves when in motion.

F, A *style*, or *alidade* being an expanding screw-nut, that embraces the axis, along which it screws, as the latter revolves with the wheel; and, as each revolution describes an exact longitudinal pole (four of which are computed to a chain), the style being pendent, and moving towards its proper figure, denotes the length of ground passed; as it is divided into chains and poles on the index of the axis E, and into links on the periphery C.

G, is a small adjusting screw; which being turned, the style may be removed to the beginning of the

index, after the given line, in surveying or measuring land, has been ascertained in chains, poles, &c.

H, represents a cross, or square, with *sights*, for determining perpendiculars in land-measuring. It is suspended at its ends on the axis, whence it may be occasionally detached by a simple touch of the finger and thumb, when in use. Farther, this cross prevents the style from being revolved with the axis by any accident. As the 320 divisions marked on the index of the axis E, describe a mile, the style F, after having passed over them, will stop: and, as it will now move round with the axis, it will carry with it the standard; which will strike on the wrist of the operator, and thus prevent him from proceeding to any farther distance, till he withdraws his hand from between such standard and the axis. Having received this hint, he turns the screw G; puts the style F. back to the bottom of the index, and continues the revolution of the machine, till he has completed his course.

Mr. TUGWELL'S contrivance is particularly calculated to prevent error in measuring land; as one person may thus survey with greater accuracy and expedition, than by the use of the chain alone. Besides, no fraud can possibly be committed by labourers, in measuring task-work; a circumstance of the utmost importance to agriculturists.

The last contrivance, we have been requested to mention, is that of Mr. RALPH GOUT, of Bunhill-row, London; whose *new pedrometrical patent-watch* differs from the instrument invented by Mr. FRASER, in this essential circumstance, that the former is connected with a time-piece, while the latter is combined with a compass. Those who live in the metropolis, or visit places, the situation of which is known to the traveller, will perhaps give the preference to Mr. GOUT'S capped metal watch with a pedometer, which he manufactures by subscription for 15*l.* 15*s.* (or the pedometer alone, for 8*l.* 8*s.*);....on the other hand, we conceive, persons residing in the country, especially sportsmen, who are generally provided with a watch on their excursions, will probably find Mr. FRASER'S pedometer, on account of its *compass*, the more useful instrument.

PELLITORY-OF-THE-WALL, the COMMON, *Parietaria officinalis*, L. an indigenous plant, growing on old walls, and among rubbish; flowering from May to September.

The leaves of this vegetable, when dry, exhibit a glassy appearance: and, if strewed on heaps of corn infested with weevils, are said to destroy these predatory insects. In cases of *strangury* (see URINE), three ounces of the expressed juice of the plant, taken internally, or, a fomentation made of the leaves, applied to the parts, are said to be of service, on account of its cooling and diuretic properties. Although chemists pretend to have extracted considerable quantities of *nitre* from the pellitory, yet we doubt whether this herb would answer the trouble of boiling it, and crystallizing the salt-petre; unless it were collected from such ground as is naturally impregnated with nitrous particles, which may more easily be obtained from the earth itself.

PELT-ROT, a disorder incident to sheep, in which the hair or wool falls off spontaneously. It arises from various causes, but

more especially in consequence of a sudden change from scanty or bad provender to full feeding; also from a local weakness in the skin, which parts with the wool; and, lastly, from the SCAB, loosening the hair at its roots. This malady may be prevented by proper attention to the animals; by giving them wholesome food, and in regular proportions, particularly during the winter. Should it, however, originate from the scab, the removal of that distemper will also cure the pelt-rot.

PENNYROYAL, or *Mentha Pulegium*, L. an indigenous plant, growing on moist heaths and pastures; flowering in the months of August and September. This herb possesses properties similar to those of the mint; but it is more acrid, and less agreeable to the palate. It has long been esteemed as an aperient and deobstruent, particularly in hysteric and other female complaints. Hence, the distilled water is generally preferred; though an infusion of the leaves would answer the purpose, without giving an opportunity for tippling. Dr. WITHERING observes, that the expressed juice of pennyroyal, with a little sugar, is an useful medicine in the hooping-cough.

PENNYWORT, the MARSH, or *Hydrocotyle vulgaris*, L. an indigenous perrenial plant, growing in marshy or inundated grounds; and flowering in the months of May and June. This herb is supposed to occasion the rot in sheep: it certainly contains an acrid, poisonous juice, which, according to BECHSTEIN, produces in the animals feeding on it, inflammations, bloody urine, and other mortal symptoms. Hence, every industrious farmer will endeavour to eradicate the pennywort from his meadows.

PEPPER, an aromatic berry, chiefly employed for culinary purposes. There are three species of this spice at present in use, which are known under the names of black, white, and long pepper.

The first, or *black-pepper*, is the fruit of the *Piper nigrum*, L. a native of the East Indies, where the berries are gathered in the month of October, and exposed to the sun for seven or eight days. They are at first green, but afterwards assume a red colour; and on being divested of their external covering, they appear in the state in which the corns are used.

The *white-pepper* is prepared by steeping the preceding sort in sea-water, and afterwards exposing it to the heat of the sun for several days, till the rind become loose. It is then taken out, half-dried, and rubbed till the husky shell separates; after which the white fruit is perfectly dried. By this process, the spice is deprived of a considerable portion of its heating property, and thus rendered more fit for various purposes, than the native black pepper. There is, however, a kind of white pepper produced on a species of the *Piper*, that is far preferable to the factitious, and is little inferior to the black spice of that name.

Long pepper is said to be obtained from a third species of the same genus of trees; it is of a cylindrical form, about an inch and a half in length: its external surface appears to consist of several small grains, arranged in a spiral direction.

All the species of pepper possess

a strongly aromatic smell, and a hot, pungent taste. The long sort, being the most powerful, is generally employed for medicinal purposes: the black is chiefly used in culinary preparations. On account of their heating and stimulating properties, however, the use of every sort requires some circumspection.

Pepper is an excellent spice, which should always be coarsely ground, and eaten only with fat, smoaked, or tough animal food; with cabbages, cucumbers, and other flatulent and cold vegetables; and likewise with fish, and all substances that are difficult to be digested. On the Continent, this spice is highly esteemed for its efficacy in relieving flatulency, weak or impaired digestion, and the giddiness which generally accompanies the complaint last mentioned. For this purpose, from six to ten grains are directed to be swallowed every morning, previously to taking food: such practice, however, ought to be adopted only in cases where the stomach is in a high degree vitiated; or the patient has been habituated to the free use of spices and spirituous liquors.

PEPPER-MINT. See MINT.

PEPPERWORT, DITTANDER PEPPERWORT, or POOR-MAN'S-PEPPER; *Lepidium latifolium*, L. an indigenous plant growing in meadows and pastures, where it flowers in the months of June and July. The whole plant possesses an extremely hot taste, not unlike pepper; and the leaves are frequently employed by the country people, as a substitute for that spice. It is esteemed an acrid antiscorbutic; was formerly used instead of the *Horse-radish Scurvy-grass*; and may be easily propagated by its spreading roots.

PERCH, the COMMON, or *Perca fluviatilis*, L. is a well known British fish, of a middling size, being covered with rough scales, and the back furnished with spiny fins. It frequents fresh water rivers and lakes, where it inhabits deep holes, and is exceedingly voracious.

Perches are very tenacious of life, and have occasionally survived a journey of 60 miles, in dry straw....The smaller of these fish are said to be a very tempting bait for the *Pike*.

The perch is a firm and delicate fish, being much esteemed at table.

PERRIWINKLE, the LESSER, or *Vinca minor*, L. an indigenous perennial plant, growing in woods and hedges: it flowers in the month of May....The leaves of this evergreen are smooth, glossy, and resemble those of the laurel: if suspended in a cask of wine recently filled, they not only clarify the liquor, but also improve its taste.....GLEDITSCH has successfully employed the whole plant, while in blossom, for tanning leather. In Germany, the country girls construct their garlands of these elegant leaves, during the winter.

[PERSIMMON-TREE, *Diospyros Virginiana*, or American Prune, Data, or Plum, a well known and valuable native tree growing in all the states in the union, south of New-York, inclusive.

The unripe plums are green and very astringent; towards winter they become of a light brick-dust colour, and when acted on by frost, are softened, and have a sweet agreeable taste.

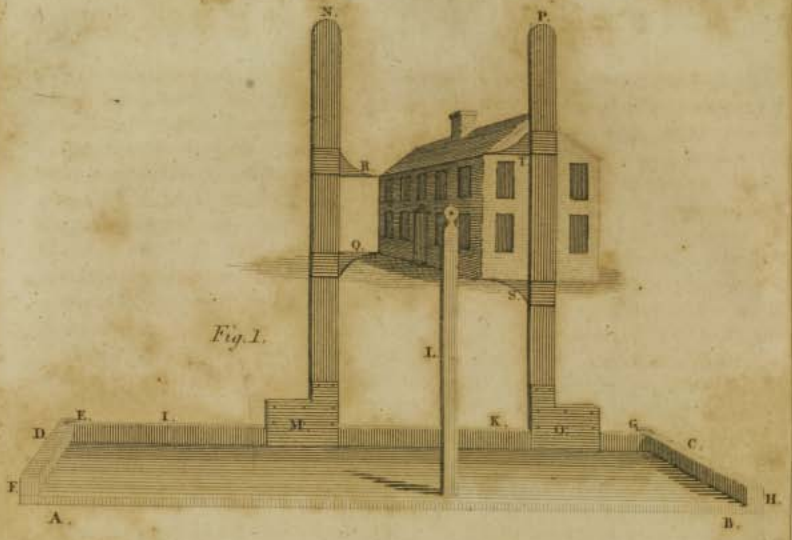
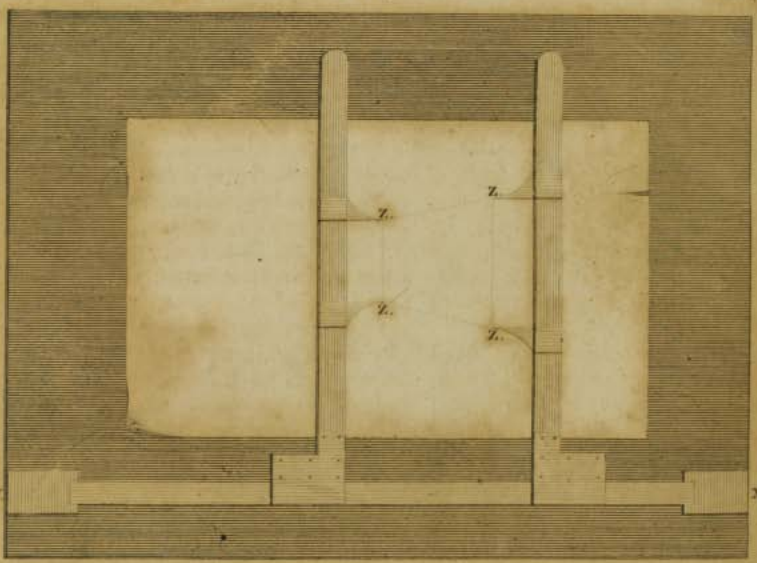


Fig. 1.

Fig. 2.



Dearborn's Machine for Perspective drawing.

A fine transparent gum, of a light-brown colour, insipid to the taste, readily soluble in water, exudes from the body of the tree.

According to Dr. WOODHOUSE's experiments on this tree, detailed in his *Inaugural Dissertation*, Philadelphia, 1792, it appears, that the juice of the unripe fruit inspissated in the sun, yields a large quantity of a brown, semi-transparent, astringent, gummy substance, of which common spirit dissolves a larger quantity, than spirit of wine, or the vegetable oils. The unripe fruit divided, *well dried* in the sun and reduced to powder, may be used as a valuable astringent remedy, in either the forms of powder, pills, or spirituous tincture, in all cases requiring astringents.

Use of the Persimmon in the arts ...Dr. WOODHOUSE says, "The unripe juice of the plum, is preferable to oak bark, for tanning. Allowing every tree to produce four bushels of fruit, and suppose three hundred trees cultivated, the quantity of gum resin, which would be produced, would be 1800 pounds, computing six pounds to a tree. The quantity of juice, would be several hundred gallons, which might be kept in barrels till wanted for use. *Country tanners should attend to this useful fact.*

As a Black Dye....Dr. W. dyed silk with an ink made of this substance, which was as black, and bore washing as well, as that dyed with galls or log-wood.

From an excellent *Memoir* upon this tree, by the late ISAAC BARTRAM of Philadelphia, inserted in the first volume of the *Amer. Phil. Trans.* it appears, that from half a bushel of perfectly ripe fruit, mashed, and mixed with two gallons of water, and fermented with a small quantity of yeast, he produced half a gallon of proof spirit, of an agreeable flavour....Beer is also made from the fruit in Maryland, by boiling it in water, straining and fermenting it, and adding hops to prevent the fermentation from going too far.

Bread is also made from the fruit, by mixing them as potatoes are with flour, in the case of potatoe bread. The wood of the tree which grows rapidly, burns nearly as well as our favourite hickory, and its ashes yield a large proportion of salts. The great value of this tree ought to induce farmers to cultivate it.]

PERRY. See PEAR-TREE.

[PERSPECTIVE MACHINE. A simple machine for drawing in perspective, was invented by Mr. BENJ. DEARBORN, of Boston..... Fig. 1, A, B, C, D, (in the annexed plate) is a plain board, with the ledges E F and G H nailed on its upper side; at E and G are notches to receive the ruler I K set in firmly edge-wise, upon this ruler slide the pieces M N and O P perpendicular to the board, the ruler passing through the brasses M and O; Q, R, S, T, are four pointers made of thin plate brass, and bent round the sliders, so that the pointing ends are upon a line with that side of the sliders which is next to the object to be drawn; the other end of the brass, coming round the slider, acts as a spring to keep the pointer in any place assigned. L is a perpendicular standard, on the top of which is a piece of plate brass with a small hole for viewing objects. The standard should be so contrived, as to be set at any required distance from the pointers, as the size of the draught will be in proportion to that distance. The

board being firmly fixed level in a window, or elsewhere, place the eye at the hole, and bring the pointers to bear for some part of the object, as for the four corners of the distant house; the instrument is then ready for drawing, which is thus done. Having a drawing-board prepared as in Fig. 2d, with a sheet of paper fixed on it, take the ruler, with its sliders, out of Fig. 1st, and carefully place it flat-wise in the notches of Fig. 2d, which are made in the pieces W and X, nailed on the drawing-board for that purpose: the pointers, by being on the under side of the sliders, will then lie flat on the paper, and direct in drawing the lines from point to point, as Z Z Z Z for the front of the house; this done, remove the ruler, &c. to their former position in the other board, take other points of the building, and transfer them to the paper, in the same manner as before: thus, in a short time, the whole building may be drawn with great accuracy."

In the *Trans. of the Royal Irish Academy*, may be seen another machine for perspective drawing, invented by Mr. EDGEWORTH.]

PERUVIAN BARK, or JESUITS' BARK, a well-known medicine obtained from the *Cinchona*, a native of South America and the West Indies. Of this valuable tree, botanists have discovered ten species; but the following only deserve particular notice, viz.

1. The *officinalis*, or PERUVIAN BARK-TREE, which was introduced into Europe by the Jesuits....It is of eminent use in fevers, especially intermittents, which it seldom fails to remove, provided it be properly administered. The doses vary according to the age of the patient, the violence of the disorder, and other circumstances; but, in vernal agues, this drug is often unnecessarily swallowed.

Peruvian bark operates differently on various constitutions: sometimes it causes vomiting, in which case it will be advisable to take it in Port-wine, with a view to check nausea or retching. If it induce looseness, such effect may be counteracted by combining the bark with opium; and, should it oppress the stomach, this inconvenience may be remedied by the addition of some aromatic. Beside its use in febrile disorders, *bark* has frequently been found of service in the confluent small-pox, by promoting the eruption, and suppuration of the pustules, while it tends to abate the violence of the fever. Nor has it been found less useful, both internally and externally, in every species of gangrene, if employed in sufficient quantities. Farther, this drug has often been successfully administered in contagious dysenteries; in *passive* hemorrhages, for obviating the disposition to nervous or convulsive diseases; and, when combined with the vitriolic acid, it has been of essential service in the rickets, scrophula, ill-conditioned ulcers: in the last mentioned cases, however, it will be advisable to adopt a milk-diet.

2. The *Caribæa v. Jamaicensis*, CARRIBBEAN, or JAMAICA BARK-TREE, grows to the height of fifty feet....The bark obtained from the trunk abounds with fibres, and is more woody than that from the branches and roots: the latter, when dried, breaks more easily, and is pulverized with greater facility than the Peruvian. The Jamaica-bark is produced in the ut-

most perfection on the north side of that island, where it is highly esteemed, on account of its very agreeable bitter, answering every purpose of that imported from Peru: nor does the former occasion any oppression at the stomach, vomiting, or nausea, but checks such disagreeable sensations in remitting fevers; and also in other cases where the stomach is disordered.

3. The *Triflora*, or TRIPLE-FLOWERED BARK-TREE, is likewise a native of Jamaica, where it grows in the district of *Manchineel*, to the height of about 35 feet. Its bark is considerably thinner, and also more fibrous and red, than either of the preceding sorts; and, on being pulverized, assumes a deep cinnamon colour. It possesses a musty, bitter, and astringent taste, and has been given for the cure of fevers, in doses of 20 grains, to adults; but, as it occasions great nausea and sickness, it is seldom employed.

4. The *Floribunda*, or St. LUCIA BARK-TREE, produces a very thin, fibrous rind, which possesses an extremely nauseous bitter taste, and is remarkably astringent.... When fresh, it proves a violent emetic; of which property it is not totally divested by age. This drug has cured both intermittent and remitting fevers, that had resisted the Peruvian bark: it is, however, seldom used, excepting in its native island; or in cases where the latter has either failed to afford relief, or cannot be easily procured.

5. The *Brachycarpa*, which was discovered about sixteen years since by Mr. LINDSAY, an eminent surgeon and botanist, then of Westmoreland, in Jamaica. It seldom exceeds eight or ten feet in height; its bark is extremely smooth and brown; internally, it resembles that of Peru in colour, but is more fibrous....This species is less bitter, and more astringent than the common bark, and has been given by Mr. L. in doses of 25 or 30 grains, with the greatest success, in intermittent, as well as remitting fevers. He has also administered it, with advantage, in the forms of tincture and of decoction, in various cases of dyspepsy or indigestion. If, therefore, a sufficient supply of this drug could be obtained it might prove an excellent substitute for the Peruvian bark.

PEWTER, a compound of metal employed in the manufacture of plates, dishes, spoons, and similar domestic utensils.

The basis of this metal ought to be *tin*, one cwt. of which being melted with 15lbs. of lead, and 6lbs. of brass, the whole forms what is called *pewter*. But there is another composition known by this name, and which consists of different portions of tin, regulus of antimony, bismuth, and copper: these, after being incorporated into one mass, over the fire, are manufactured into vessels like those of common pewter.

From the dangerous properties of the ingredients employed for such domestic articles, great attention will be requisite, to keep them constantly in a clean state, and to suffer no acids or fermented liquors to remain in those utensils.....We are persuaded that many hidden and unaccountable causes of disease, especially of nervous and paralytic affections, arise from a quarter where they are least suspected. See also in the articles, CYDER, and LEAD.

PHEASANT, or *Phasianus*, L. a genus of birds, comprising several species, of which the following are the principal, viz.

1. The *Gallus*. See Cock and Hen.

2. The *Colchicus*, or Common Pheasant, originally a native of Asia, and thus denominated from the river *Phasis*, in Mingrelia: it is one of the most beautiful birds, on account of the vivid colour, and diversity of its plumage. In Britain, it inhabits woods, brakes, and thickets, in the day-time; and at night, roosts on the tops of the highest trees.

Wild pheasants construct their nests of dry grass and leaves, among bushes; and the female lays from twelve to twenty eggs in a season: the period of incubation extends to 24 days; but the young, being unable to provide themselves with food, would starve, if left solely to the protection of the hen.....For breeding pheasants, five hens may be allowed to a cock; these, if put together in a farm-yard, will soon acquire habits of familiarity with the common poultry.

Young pheasants are extremely difficult to be reared: their most proper food consists of ant's eggs, mixed with curds, or sweet oats and barley, which must be given them with great exactness, both as to the quantity and the time of their meals. The place in which they are confined, should be kept thoroughly clean; their water frequently changed; and the young birds not exposed to the dew of the morning, or allowed to ramble about, after sun-set.

When diseased, a repast of ant's eggs will, in general, speedily promote their recovery; but, if this remedy prove unsuccessful, wood-lice and earwigs, in equal proportions, seldom fail of restoring their health.

As an article of food, the flesh of pheasants is esteemed one of the greatest dainties. [See Tetrao.]

PHEASANT's-EYE, the Autumnal, Corn Adonis, Adonis Flower, Red Maithes, or Red Morocco; *Adonis autumnalis*, L. an indigenous annual plant, growing in corn-fields, and flowering in the months of June and July.....It may be easily propagated from seeds, which ought to be sown in a light soil, in autumn, soon after they are ripe; as otherwise they seldom succeed. When the plants appear above ground, they should be carefully weeded, and occasionally watered in dry weather; but it will not be advisable to remove them till the autumn of the second year; when they may be transplanted to the place of their destination...The beautiful scarlet blossoms of this plant, greatly recommend its culture in gardens; incalculable quantities of them being sold in the metropolis, under the name of *Red Morocco Flowers*.

PHOSPHORUS, a term generally given to such bodies as are luminous in the dark, without emitting heat or flame.

According to modern chemists, phosphorus is a simple, inflammable substance, which cannot be decomposed: when pure, it is transparent, and of a whitish colour; being slightly tenacious, and fusible in a degree of heat inferior to that of boiling water. It constitutes a part of all organized bodies, whether of the animal, vegetable, or mineral kingdom. Thus, if wood be decomposed by putrefaction, in a certain degree of heat and moisture, then broken into fragments, and

exposed to the oxygen of the atmosphere, it will become luminous in dark places. Putrescent veal also shines under similar circumstances; and likewise the sea-weeds usually employed in packing oysters.

The existence of phosphorus in vegetables, was first ascertained by M. Margraaf, who observed, that farinaceous grains, when exposed in close vessels to an intense heat, in a peculiar degree possessed this property of emitting light. It has, farther, been discovered in sugar, gum-arabic, flower, dung, urine, bone-ashes, and every other animal and vegetable substance; by the process adopted in preparing the artificial phosphori of Homberg, Kunkel, and other chemists.

Properties of Phosphorus:...Characters drawn on paper with solid phosphorus, will appear like a flame in the dark; though, in the light, a dense smoke only will be perceptible: and, if such paper be held near the fire, the letters will immediately become black, and continue to be as legible as those formed with ink. Great caution, however, ought to be observed in making such experiments; because, if a particle of phosphorus be rubbed between two papers, they will immediately take fire, which cannot be easily extinguished; hence it will be advisable to keep this inflammable matter continually immersed under water.

As phosphorus exists in all vegetables, Dr. Darwin conjectures that it forms one of the articles of their food, and is absorbed entirely by their vessels, as often as it occurs in a state of solution; though it may also be occasionally formed, and secreted, by plants. In his opinion, it essentially contributes to their growth, and imparts firmness to timber-trees....See Phosphoric Acid.

In a medicinal view, phosphorus has a remarkable effect on the human frame; and, when administered with judgment and circumspection, forms a very powerful and valuable remedy. According to M. Barchewitz, and other Continental writers, it has proved of essential service in paralytic, epileptic, melancholic, and maniacal attacks; in every species of eruptive fevers; particularly in those where the eruption *strikes in*, and is accompanied with anxiety, convulsions, and other nervous symptoms. He directs it to be given in doses of one grain, mixed with conserve of roses, or with any of the syrups....Farther, a variety of cases have lately been publishsd by M. Leroi, in France, who administered phosphorus internally with the greatest success, in consumptive diseases; in malignant fevers, where it effectually checked the progress of gangrene; and especially contributed to the recovery of persons who had been reduced by intemperance. So potent a medicine, however, ought to be employed only with the utmost caution, and under the immediate superintendance of a competent judge.

Phosphoric Acid, is a peculiar acid, fixed in the fire, and composed of phosphorus, in combination with oxygen. It constitutes a material part of bone-ashes, from which it may be easily extracted by calcination, in the following manner: Take a large glass-jar and dilute *one* pound of oil of vitriol with *twelve* pounds, or pints of water; then add gradually, under constant agitation of the mixture,

one pound and a half of finely pulverized ashes of bones, calcined to whiteness. During this process, an effervescence takes place, and a very pungent odour is disengaged. The vitriolic acid now forms gypsum, or sulphat of lime, by combining with the calcareous earth of the ashes; and the phosphoric acid, thus separated, unites with the water....We have purposely inserted this experiment, as we have reason to believe that the *phosphoric acid*, when largely diluted (for instance, in the proportion of one or two drams of the acid to every gallon of water) will prove highly fertilizing to the vegetable mould employed by gardeners. And, though we cannot sufficiently corroborate such conjectures from our own experience, yet there appears to be ample ground to recommend farther trials to be made with this active and powerful agent. We have already remarked, that it exists throughout the vegetable kingdom, and is supposed (by one of our most profound inquirers into the arcana of Nature) to have a considerable share in the process of vegetation. It has also been discovered in the mineral kingdom; for instance, in the *apatite*, or phosphat of lime; and in the green *lead-spar* found at Zschopau, in Saxony....This acid produces similar effects in the animal economy with the solid phosphorus: and, when used as an ingredient in lemonade, M. Leroi informs us, that it has proved of eminent service in the disorders above mentioned.

Phrenzy. See *Inflammation of the* Brain.

Phthisis. See Pulmonary Consumption.

Physic. See Medicine.

PHYSICIAN, an appellation given, in general, to those persons only, who exercise the medical profession, under the sanction of a diploma granted by an university, after a regular course of study. In a strict sense, every surgeon, or apothecary, who has received a liberal education, and practises the healing art on scientific principles, is fully entitled to the same distinction; though he have not obtained the degree which constitutes a *doctor of medicine*.....Consistently with this explanation, we shall venture to illustrate the official capacity of a physician, with a few occasional remarks.

When we consider the almost boundless acquisitions to be made in the different branches of natural knowledge, as well as in the practical acquaintance with that complicated machine in which the human mind acts the most conspicuous part; when we reflect on the various requisites to *form* the character of a *true* physician, and the great trust reposed in him by all ranks of society....it will not appear surprizing to the cool observer, that, in this honourable profession, the number of its adepts should be equally diversified by their talents, their claims to public favour, and their modes of action.

A man, who maintains this important station in society, ought, besides a competent share of knowledge, to possess a humane and sympathizing, though intrepid, disposition of mind: he must be candid on all occasions, without any studied reserve, but circumspect in his declaration to the patient; and, where danger is to be apprehended, nothing should deter him from concealing the probable termination of the case from parents, or the nearest relations. Nor will a physician of a

liberal and enlightened mind, hesitate to explain the reasons, or causes, which induced him to prescribe certain medicines, in preference to others, perhaps differing from those of his predecessor. And, if he cannot, on the spur of the moment, determine himself respecting the most proper treatment, instead of prescribing conformably to the common routine of business, or copying a recipe from his memorandum-book, he will frankly inform the patient of the difficulty attending his complicated disease, and give the most appropriate directions for arranging every part of his diet and regimen. Thus, he cannot fail of acquiring confidence and credit; while he enjoys the pleasing satisfaction, that he has acted consistently with his conscience, and the dignity of his profession.

On the contrary, the *man of business*, when entering the sick-room, will previously direct his attention to the curtains, pictures, chairs, &c. instead of examining with the most scrutinizing attention the expressive countenance of the person, whose life perhaps depends on the *first* criterion, thus neglected. The truth of this remark must be obvious to every rational practitioner; though the result of it be not always of equal consequence. Having asked a few superficial questions (which are scrupulously repeated to every patient, and couched in the most concise phraseology, *in order to save time and trouble*) the man of business hastily feels the pulse; and, as it were by inspiration, writes a most elaborate and mysterious prescription, which is always obedient to *his* will :....a work of ten or at the farthest fifteen, minutes! Its effects, however, are not so uniformly favourable to the expectations, and sanguine hopes of the patient :....nevertheless, after observing the operation of the medicines swallowed, in consequence of the second, third, or fourth visit, the disease acquires a name and character, not only corresponding to the symptoms *now* evident, but likewise to the definition given by the best nosologists. Thus, error is reconciled to error; and the daily reward is collected, while Nature exerts herself under this struggle of symptoms, till she at length makes a *critical* effort, either for the recovery or dissolution of the patient. Such is said to be the practice of those physicians, who degrade their profession into a *trade*; which is comparatively less respectable than that of the lowest mechanic!

Having hazarded these observations on the usual *routine* of a modern, or fashionable, physician, we deem it our duty to point out those circumstances, and conditions, which deserve minute attention in the *first examination of a patient*.

In order to obtain a clear and complete view of *chronical diseases*, it will be requisite to proceed *systematically*, and to enquire into the following particulars: 1. Duration of the disease. 2. Age and sex of the patient. 3. His external form and constitution of body. 4. His usual occupations, trade, or rank in life. 5. Whether married or single. 6. Climate; native country; and local situation with respect to dwelling. 7. Domestic circumstances and employment, if connected with the disorder. 8. Disposition of mind; cha-

racter; mode of thinking; if influenced by political or religious views. 9. Extent of his mental capacity, or cultivation of mind. 10. Favourite pursuits. 11. Usual intercourse, or society. 12. Particular habits or customs. 13. Mode of living, with respect to food and drink. 14. Local or external affections. 15. The peculiar temperament.

When these preliminary inquiries have been cautiously instituted, without intruding on the patient; or appearing too officious to his affable relations; the systematic practitioner will next endeavour to ascertain the following data, leading to a more intimate knowledge of the disease: 1. The countenance of the patient. 2. His situation and posture in bed, or gait in the room. 3. His previous state of health. 4. The remedies and physicians he has employed on former occasions. 5. Idiosyncrasy, or peculiarity of constitution. 6. Instinctive propensities. 7. The prevailing character of diseases at the time, whether of an infectious, epidemic, or endemic nature.

Lastly, in order to discover the exact deviation from a natural or healthy state, none of the following points ought to be disregarded; though it should be impracticable to pay the most scrupulous attention to each, at the *first* interview: namely, 1. The internal and external sensations of the patient. 2. The commencement and progress of the disease. 3. Pulse. 4. Breathing. 5. Muscular energy. 6. The appearance of the head and hair. 7. The throat and neck. 8. Deglutition or swallowing. 9. The chest. 10. The abdomen. 11. Appetite for eating or drinking. 12. The back or vertebrae. 13. The anus. 14. Vision, and the eyes, eye-lids, region about the eyes, and lachrymal glands. 15. The skin, with respect to its colour, and elasticity. 16. The nails. 17. The organ of smelling. 18. The prevalent taste in the mouth; appearance of the tongue and palate, together with the lips. 19. The organs of hearing. 20. State of the bowels, whether lax or costive. 21. Urine. 22. Insensible perspiration. 23. Expectoration. 24. Nausea, retching, or vomiting. 25. The circulation of the blood. 26. The organs peculiar to the sex, and their functions. 27. Periodical evacuations designed by Nature. 28. Sleep.

Beside these general points, which relate to every individual, an experienced inquirer will adapt his questions to the particular age, sex, and condition of the patient:.... thus, children and young mothers; the nervous and hysteric; the hypochondriac and melancholic; each will suggest to his mind a different course for ascertaining the nature, seat, and origin of the disease. The result of this examination constitutes the difference between the empiric, and the rational physician: the former cures *symptoms*, not unlike the sagacious old woman who has studied Hill's and Culpepper's *Herbals*, or Buchan's *Domestic Medicine*, and similar *Family Physicians*: but the chief object of a medical philosopher, is the removal of *disease*, without neglecting the mitigation of painful symptoms; provided they originate from natural, not incidental causes; or in other words, if they are connected with the state and progress of disordered functions. Who, then, will pretend, or believe, that a task so important and complicated, can be accomplished

during the usual short visit paid by a *fashionable physician?*

[PHYSIOGNOTRACE, an instrument lately invented by Mr. JOHN HAWKINS of Philadelphia, by means of which, the outlines of the human face may be taken in a minute, and so striking is the likeness produced, that it may be immediately known.

The person, whose portrait is to be taken, is seated upon a chair, with his cheek resting upon a projecting piece of board, that the head may be kept steady in one position. A brass ruler is then passed over the head and face, and a metallic pin, which makes parallel movements with the ruler, marks the exact profile upon a small sheet of paper. One of these machines is placed in PEALE'S *Museum* in Philadelphia, and has been used with success.]

PICHURIM BEANS, are the fruit of the *Faba Pichurim*, a native of South America; and of which there are two varieties, known under the names of the Greater and Lesser Pichurim Beans. The pods of the latter contain a gross oil, which is obtained by bruising and submitting them to the action of a press. The former, when reduced to powder, yield an essential oil by distillation.

These beans possess considerable astringent properties, and were formerly employed, in doses of ten grains reduced to powder, in diarrhœas and dysenteries.

PICKLE, a kind of brine or liquor, which is generally prepared of salt and nitre, with the occasional addition of spices, or aromatic herbs, for the preservation and seasoning of flesh-meat. *Pickle* also signifies vegetables preserved by the use of vinegar and aromatics. See PICKLING, *of Vegetables*.

Under the articles BACON and BRINE, we have already stated the general requisites to a good pickle: we shall, therefore, only add a few particular directions relative to this subject. It has been ascertained by experience, that the best proportion of salt and nitre to that of *beef*, is the following: Take 8lbs. of common salt, previously dried in a warm room, and 1½oz. of salt-petre, likewise in a dry and pulverized state, to every 112lbs. of meat: let the salts be properly incorporated before they are applied. The beef should be perfectly fresh and cool; as otherwise it cannot be preserved for a considerable time: the cask or vessel ought to be clean, dry, and provided with a moveable lid or cover, so as to support a weight on its top. Much, however, depends on the exact proportion of the saline ingredients in the pickle; and the accuracy with which these compound salts are distributed between the different layers of the meat; for if any cavities remain between the pieces so that air can penetrate and circulate through the interstices, it will be impossible to keep such meat many weeks, in an eatable state.

A similar preparation may be used for *pork*, *mutton* and *geese*; which last, however, should be divided at least into two equal parts. Thus, the farmers in Germany pickle the different kinds of meat above mentioned, together with their beef, in the same vessels; chiefly with a view to fill up the vacant places at the sides, and prevent the corruption of the latter.

PICKLING, *of vegetables*, is one

of the modern refinements of luxury, which, in point of health, deserves no commendation. It is effected by employing the strongest vinegar, together with the most heating spices. This compound is rendered still more efficacious by previously boiling the vinegar with cream of tartar, before the aromatics are added. In such state, most vegetable roots, plants, fruits, seeds, walnuts, &c. may indeed be preserved for any length of time, in order to stimulate the palate occasionally; and as it is supposed to promote the digestion of animal food: but, as the nourishing juices of vegetables are thus decomposed and the fibrous or woody parts alone remain in the form of a sponge, we conceive such artificial preparations to be useless to a robust stomach, and detrimental to the digestive organs of invalids, or delicate constitutions. When used in very small portions, and only with fat and tough animal food or fish, pickles may serve as substitutes for salt, mustard, horse-radish, or pepper....It deserves farther to be remarked, that all pickles should be kept in earthen, but *unglazed* vessels; no copper or verdigrease must be employed; the air should be carefully excluded; and the room in which they stand ought neither to be damp nor warm.

PICTURE, a specimen, or piece of painting, in which particular persons, or subjects, are represented in colours, on wood, paper, canvas, &c.

Pictures form a valuable, though not a necessary, part of domestic furniture; and, as they are liable to become obscured by dust and smoke, or otherwise damaged, various expedients have been contrived to clean them. With this view, an ounce of tartar, and a similar quantity of glass-wort, may be boiled in a pint of water, till the liquor be reduced to one half, when it should be strained: while lukewarm, a sponge is to be dipped in the fluid, and rubbed over the picture; which must be washed immediately after with tepid water, and gently wiped till it becomes dry. A few whites of eggs are now to be beaten up, and applied with a feather to the painting, which will thus acquire a fine varnish.

As, however, the ingredients used by the painter often vary in different pictures, there can be no general rule given for removing superficial impurities; because the success of the experiment entirely depends on the application of proper substances; such as are capable of combining with dust, smoke, &c. without affecting either the varnish or colouring matter..... Hence, the safest process will be that in which the mildest means are employed; of this nature is the following expedient: Let the picture be first taken out of the frame, then covered with a clean napkin, which should be moistened with pure water, and suffered to remain in that state for a fortnight or longer, according to circumstances. During this period, the cloth should be occasionally wetted, till it has loosened or softened all the adventitious particles on the surface. A small quantity of purified linseed-oil is now to be passed over the picture, which will thus, in most instances, resume its former lustre.

For cleaning very *old paintings*, it has been recommended to make a ley of rain-water and wood-ashes,

or preferably with purified pearl-ashes; and to cleanse them carefully with this lixivium. Such applications, however, as well as those of soap-water, spirits of wine, turpentine, &c. require to be employed with great precaution; because they are apt to corrode the oil of the painting, and thus expose the colours to material injury from the slightest friction. Alkaline solutions, or spirituous liquors, therefore, should be used only for particular spots, that have resisted the action of simple water, the oil of olives, or fresh butter. If these substances were timely resorted to, they would, in general, restore the picture to its pristine beauty, without affecting the delicacy of its shades.

PIG-NUT. See EARTH-NUT.

PIGEON, or *Columba*, L. a genus of birds, consisting of 70 species, of which the *ænas*, or Domestic Pigeon, is a native of Britain. It is in general of a blueish ash-colour, and weighs from twelve to sixteen ounces.

This bird, with all its numerous varieties of *tumblers*, *carriers*, *powts*, &c. is derived from one species, denominated the *stock-dove*. In a wild state, it breeds in the holes of rocks, and in hollow trees; but is easily reclaimed, and induced to build in artificial cavities, assigned for its habitation, where it becomes completely domesticated.

Pigeons are uncommonly prolific; and, though the hens, or DOVES, lay only two eggs for each brood, yet those reared about the house, and suffered to fly abroad in quest of food, breed eight times in the year; nay, the species termed *monthly pigeons*, produce young ones almost every month: hence it has been computed, that from one pair of these birds, if properly managed, the astonishing number of 14,760 may be obtained in the course of four years. It is farther remarkable, that the eggs laid in the afternoon are generally addled; that the dove sits on her eggs from three o'clock in the afternoon till eight in the morning; that the male performs this office during the rest of the time; and that the term of incubation is from 17 to 20 days....They attain an age of 12 years; though, after the fourth year, their fecundity begins to diminish. An open situation and a free exposure to the sun's rays, equally contribute to their prosperity; while common salt and nitre ought to be frequently given them, in order to preserve their health.

Pigeons are esteemed as a delicacy at the table, especially when young, and properly fed.....their dung is an excellent manure for particular soils; beside which, these birds are of great service in farms where wheat is chiefly cultivated; because they devour the seeds of weeds, that would otherwise impede the growth of the corn.

PIGEON-HOUSE, or DOVE-COTE, a structure usually erected of wood, for the accommodation and rearing of pigeons.

Dove-cotes ought to be built of a moderate height, and spacious, so that the birds may find sufficient room to fly about them with ease; and, in case any external object should alarm them, that they may readily escape. In constructing the nests, it will be advisable to interweave wickers, in imitation of those formed by wild pigeons; as they will thus be more easily domesticated, and have no in-

ducement to forsake their habitations.

Should any repairs become necessary in the cote, or in the nests, it will be proper to complete them before the middle of the day; because, if the pigeons be disturbed in the afternoon, they will not rest quietly during the night, and the greater part will perhaps sit *moping* on the ground, till the ensuing day: such unfavourable accidents, in the breeding season, will either occasion the destruction of many eggs in embryo; or if there should be any nestlings, they will consequently be starved.

In Mr. PARKINSON'S *Experienced Farmer*, we meet with a remark made by a skilful pigeon-breeder, who cautioned him "against letting the first flight fly to increase his stock," but advised him to take them without exception; because they will otherwise appear at the *Benting-season*, that is, between seed-time and harvest, when pigeons are very scarce, and many of the young birds would pine to death, from mere weakness. Pigeons rise early: and, as they require to be supplied with food only during the benting season, it should not be carried to the cote later than three or four o'clock in the morning: for, if it be served long after that hour, they will hover restlessly about the house, and thus be prevented from taking their proper exercise. During the greater part of the year, they ought to provide their own food; as they will find abundance in the fields, from the commencement of harvest to the end of sowing season: on the contrary, those which are constantly fed at home, will not be prolific.

The spring-flight generally appears in the month of April or May; when all the eggs, which have been laid too late, must be removed. And, as the weather becomes cold after the harvest, the parent bird should not be suffered to sit so late as to be injured; for, though the young ones be hatched, they will be weakly, and useless; a warm situation being most suitable to their nature.

The utmost cleanliness ought to prevail in pigeon-houses: hence the holes should be carefully examined, before the breeding-season arrives. If any of the young die during the summer, they will speedily become putrid, and emit a disagreeable stench, which is extremely injurious to the inhabitants of the dove-cote: thus, from the insupportable filth, and smell, they are often unwillingly compelled to quit the eggs laid for a second brood; so that the principal part of the season is lost. Farther, as pigeons are very liable to be infected with fleas, all the nests ought to be cleaned; and, if it be conveniently practicable, they should be *washed out*, and the dung, or other impurities removed, immediately after the first flight is hatched: this business, however, should, on all occassions, be performed at an early hour in the morning; and the remaining eggs must likewise be removed, so as to render the habitation perfectly clean for the harvest-flight.

Thus managed, pigeons will thrive and multiply to an uncommon degree; but, as they have a great antipathy to owls, which sometimes enter their habitations, such intruders must be immediately destroyed. Rats, cats, weasels, and squirrels, are likewise their *mortal* enemies, and will

speedily depopulate a whole dove-cote. To prevent these depredations, it will be necessary to examine the different avenues to the pigeon-house, regularly oncea week, or oftener, and with minute attention. Among the most common disease as of these birds, are, a species of itch, and a pustular eruption resembling the small-pox; either of which may be cured by mixing small quantities of crude antimony, in powder, with pure water, for their daily drink, till the skin appear perfectly clear. From Mr. PARKINSON'S book before quoted, we learn, that a *pigeon-conjurer*, who, by fascinating means effected the return of his emigrant birds, together with a colony of strangers, employed *salt* and *asa-fœtida*, as the principal ingredients in his secret compositon.

Those of our readers, who wish to acquire more extensive information, respecting the management of the domestic pigeon, will be amply gratified by the perusal of Mr. GIRTON'S *Complete Pigeon-Fancier*, &c. a small work, of which several editions have lately been published.

PIGMENTS, are preparations in a solid form, chiefly employed by painters, for imitating particular colours, and imparting them to the surface of bodies.

Pigments are obtained from animal, vegetable, and mineral substances; the last, however, are the most durable. In the progress of this work, we have pointed out various materials, that may with advantage be applied to the purposes of the painter, especially under the articles COLOUR-MAKING, and COLOURING-MATTER: it would, therefore, be superfluous to repeat, in this place, those multifarious articles which are described in their alphabetical order; as the reader will be furnished with a distinct and complete arrangement of such matters, at the conclusion of this Encyclopædia, in the *General Index of Reference*.

PIKE, or *Esox Lucius*, L. an exceedingly bold and voracious fish; they cast their spawn in March or April, according to the mildness of the weather; and, while in high season, are variegated with beautiful green, yellow, and red colours; but, when these tints change, the fish are of inferior quality. There is a peculiar method of taking the pike, practised, both in Lincolnshire and the island of Ceylon, by means of a *crown-net*, which is formed of a semi-circular basket, open at both ends. The sportsman, being provided with a small fen-boat, frequently immerses the machine to the bottom of the water; then with a pole ascertains, by the striking of the fish, whether he has been successful: by this simple expedient, great numbers of them are taken. It is farther stated, that pikes are often haltered in a noose, and thus secured while asleep, in the ditches near the Thames.

In angling for pike, the line should be very strong, with a large Kirby pike-hook, fastened with gimp, which is far preferable to wire. The hook may be baited with a middle-sized roach, or a dace, gudgeon, small carp, or tench.

PILES, or HÆMORRHOIDS, are small round excrescences appearing on the verge of the anus, without any apparent swelling:.....if attended with a discharge of blood, they are termed the *bleeding piles*; in the contrary case, *blind piles*.

This affection is generally accompanied with a sensation of weight, pain, or giddiness in the head; difficulty of breathing; nausea and sickness; pains in the back, loins, and anus.

The piles chiefly occur in persons, somewhat advanced in years, and disposed to corpulency; in the plethoric, and debilitated; in those who lead sedentary and luxurious lives, especially in men who are addicted to the free use of liquors. If the disorder be inherited, it usually appears at an early period of life; and sometimes during childhood, or even infancy. In the periodical bleeding piles of hysteric, hypochondriac, or gouty patients, no medical assistance will be requisite, so long as the flux continues moderate; for, in such case, it is a salutary effort of Nature.

The pre-disposing causes of the piles are, obstinate costiveness; voiding of hard feces; acrid purgatives, especially such as contain aloes; obstructions in the hæmorrhoidal vessels; the frequent use of highly-seasoned food, and of sweet wines; the indulgence in violent passions; and lastly, *sitting on damp ground.*

Hæmorrhoidal patients ought to attend to their habits of body, their strength, age, and mode of living; because such discharges as may prove hurtful to some, may be very beneficial to others. One ounce of rich conserve of roses, mixed with new milk, and taken three or four times in the day, has been found of considerable service, if continued for several weeks, or months, till its effects become evident. Peruvian bark has also proved useful, on account of its invigorating and astringent properties; but, where the piles have originated from obstinate diarrhœas, small doses of ipecacuanha, or other gentle emetics, have been administered with the greatest success....If costiveness occasion this complaint, proper attention to that circumstance will be requisite; but, if the disorder originate from weakness, or want of tone in the *rectum* (see Abdomen), strong purgatives must be avoided; the part affected should be bathed twice a-day with a sponge dipped in cold water, and the bowels regulated by the mildest laxatives.

In the *blind* piles, blood-letting has occasionally been of essential service; though we are no advocates for *artificial* evacuations.... Emollient injections may be employed with advantage; but, where the diseased part is obstructed to such a degree as to render the application of clysters impracticable, gentle emetics have often been eminently useful. If the tubercles be very painful, and no discharge ensue, the patient should sit over the steam of warm water: and, in case no relief be thus obtained, leeches must be applied to the tumors themselves, or the adjacent parts: if, however, these insects do not adhere, it will often be necessary to employ the lancet.

Among the numerous remedies devised for the cure of this malady, none appears to be more efficacious in the most inveterate cases, than the internal use of *sulphur.* Persons of a costive habit may take of this mineral five grains, with half the quantity of rhubarb, two or three times every day, either in pills, or mixed with conserve of roses: which doses should, according to circumstances, be continued for several weeks, or longer. In plethoric constitutions, a few grains

of nitre may be added to each dose; the propriety or safety of which, however, ought to be decided by professional advice.

Various external applications have been recommended for the piles; but, as they are either too stimulant and hazardous, or designed only to cool and keep the parts in a moist state, this object may be effected by means of emollient poultices...Where the pain is extremely acute, the application of common or fresh linseed-oil, or of juniper-oil, has frequently mitigated the sufferings of the patient.

During the prevalence of this complaint, the diet should be cool and nutritious, consisting principally of milk, bread, vegetable jellies, broths, &c. Fermented and spirituous liquors will be hurtful: hence the patient ought to drink decoctions of the march-mallow roots, and other mucilaginous vegetables; orange whey, &c. He should, farther, studiously avoid the influence of the depressing passions, and whatever may tend to aggravate the disorder; especially riding on horse-back, and sleeping in feather-beds....On his recovery, moderate and daily exercise in the open air will greatly contribute to invigorate the constitution; while his meals are temperate, and his conduct is adapted to the preservation of health, which otherwise will ever be in a precarious state.

PILEWORT, the COMMON, or LESSER CELANDINE, *Ranunculus Ficaria*, L. an indigenous perennial plant, growing in meadows and pastures; and flowering in the month of April....This herb may be eaten in the spring, either boiled or in salads. Its root is uncommonly acrid, and blisters the skin; so that it may be employed as a vesicatory. Nevertheles, BRYANT, a French traveller, informs us, that, by skilful management, a tolerably good *starch* may be extracted from these roots.

PIMENTO. See ALSPICE.

PIMPERNEL, the SCARLET, or *Anagallis arvensis*, L. an indigenous plant growing in corn-fields and sandy places; flowering from May till August....Dr. WITHERING observes, that every part of this plant is singularly beautiful: according to BECASTEIN, it is much relished by sheep, and its flowers were formerly in great repute, for their supposed efficacy in curing the bite of a mad dog, as well as the giddiness in sheep....It is farther remarkable, that these flowers regularly open between eight and nine o'clock in the morning, and close their petals at four in the afternoon.....[See BITE of a Mad-dog.]

PIN, a well-known little instrument, usually made of brass-wire, *blanched*, and which is chiefly employed by females, in adjusting their dress.

Notwithstanding the apparent simplicity of pins, their manufacture is extremely curious and complex; but, as a description of this article might be acceptable only to a few of our readers, we shall confine our attention to the treatment which ought to be adopted, in case any pins should be inadvertently swallowed. Such accidents sometimes happen, to persons who imprudently accustom themselves to hold these dangerous utensils in their mouth, and even frequently retire to bed without removing them; an injudicious practice, that cannot be too severely reprimanded; for a sudden fit of coughing,

or numerous other causes, may easily force the pin down the gullet.

As soon, therefore, as it can be ascertained that this pointed substance has been swallowed, it will be advisable to take considerable draughts of vinegar and oil of almonds; or, if the latter cannot be readily procured, any other sweet or salad oil may be substituted. Tartarized antimony, or tartar emetic, has, likewise, proved a very effectual remedy in such distressing situations: it ought to be given in doses of four or five grains, dissolved in warm water, which should be followed by the whites of six raw eggs, if the patient be an adult. These will coagulate in the stomach; excite vomiting; and thus occasion the ascending of the pin, together with the sheathing matter....See also GULLET.

PINCHBECK, a factitious metal, the colour of which resembles that of gold; and which has received this appellation from its inventor....It is produced by melting one part of *zinc* with five or six parts of *copper*; and it becomes more or less malleable, according to the purity of those metals. Some metallurgists, however, direct equal parts to be melted together; but Dr. LEWIS observes, from his own experiments, that pinchbeck bears a greater resemblance to gold, by employing zinc either in the largest or in the smallest proportion, than by using similar quantities of each ingredient.

Pinchbeck is manufactured principally into cases and chains for watches.

PINE-APPLE, the COMMON, or *Bromelia ananas*, L. is a native of Mexico and the Brazils, whence it has been introduced into Europe. It is propagated in Britain, by planting either the *crowns* or excrescences growing on the fruit, or the *suckers* produced from the sides of the plant (after they have been exposed in a warm place to dry for three or four days), in pots of light fresh mould, mixed with rotten dung; which has been prepared six or eight months, in order that its parts may be more completely united. They are now to be plunged in a hot-bed; and, if the season be warm, it will be advisable to water the plants, at least, twice in the week; though, in cool weather, one irrigation will be sufficient.

A practice prevails among some gardeners, of removing pine-apples to various pots: thus, however, the growth of the fruit is materially retarded; as the plants require to be placed in fresh pots only twice in one season, viz. first, towards the end of April in the second year, when the crowns and suckers of the preceding year must be transplanted into pots of a larger size; and, secondly, in the beginning of August; when such as are of a proper age for bearing fruit, ought to be removed into pots proportioned to their growth. With every change, the hot-bed should be stirred up, and fresh bark added, so as to raise it to the height at which it was originally formed; and, on re-placing the pots in such bed, the points must be gently watered, in order to clear the dust, &c. from the leaves..... Thus managed, pine-apples will require little additional trouble, till the commencement of the winter; when the heat ought to be increased by artificial means of stoves or flues, and the plants to be watered

gently every week, or oftener, if the mould should become dry.... Farther, no pine-apples should be removed into fresh pots, after the fruit appears; for such attempts would not only impede its growth and maturation, but likewise impair its delicate flavour.

The principal difficulty attending the propagation of this valuable exotic, in Britain, is the extirpation of the insects that infest it; and of which Mr. SPEECHLEY, in his practical "*Treatise on the Culture of the Pine-Apple*" (8vo. 1*l.* 1*s.* 1779), enumerates three species, viz. the *Brown Turtle Insect* (Coccus hesperidum, L.): the *White Scaly Insect*; and the *White Mealy-crimsoned Insect*. The expedients usually adopted for destroying such depredators, having failed of success, Mr. SPEECHLEY recommends the following preparation:....Take one pound of quicksilver, put it into a glazed vessel with one gallon of boiling water, and let it stand till it become cool, when the liquid must be decanted for use. This infusion must be repeated on the same quicksilver, till a sufficient number of gallons be provided. Next, six ounces of soft green soap are to be dissolved in each gallon; and the whole made lukewarm. The plants should now be taken out of the pots (the leaves of the larger ones being previously tied together), and immersed wholly in the liquid for three minutes; at the expiration of which time they must be exposed to the open air with their *roots* downwards, till they are dry. In the course of a few hours, the immersion should be performed a second time, previously adding one table spoonful of sweet oil to each gallon of the mixture; after which the plants are again to be dried with their *tops* inclining to the ground; and, as soon as the moisture is evaporated, they may be returned to the hothouse...The proper season for taking these preventive measures, are stated to be the months of March and September.

In the 67th vol. of the *Philosophical Transactions* of the Royal Society, we meet with a curious and simple method of raising pine-apples *in water*, by WILLIAM BASSET, Esq. The plant, contained in a pot of earth, is placed in a pan that is kept constantly full of water, and which is deposited on a shelf near the highest and most heated part of the back-wall of a hot-house; so that the pine-apples stand as closely as possible to the glass, without coming in contract with it....The fruit thus raised, is said to be uniformly larger, and to possess a finer flavour than such as is propagated in the usual manner on bark-beds.

Pine-apples generally attain to maturity, in Britain, from the month of July till the end of September; but, when too frequently removed to different pots or otherwise mismanaged, they will not ripen till the end of October, or November. Their maturation is known by the strong aromatic odour which they exhale, and by the facility with which the *crowns* or protuberances yield, on pressure with the hand. As their flavour is speedily dissipated, by remaining on the plants longer than three or four days, they ought to be cut at the expiration of that time, and to be eaten within 24 hours, at the farthest....This de-

licious fruit is reputed for its cordial and exhilarating properties: its acid juice, however, generally disagrees with females during gestation, as well as with persons who are subject to flatulency.... Among the different sorts raised in hot-houses, BECHSTEIN observes, the *white* and *red* pine-apples are the most esteemed: their juice, when fermented, yields a most agreeable and wholesome vinous liquor.

PINE-TREE, or *Pinus*, L. a genus of trees consisting of 30 species, of which the following are the most remarkable:

1. The *pinea-ster*, or WILD PINE, is a native of the mountainous parts of Italy, and the South of France, whence it has been introduced into Britain. The cones of this species are remarkably large, containing a white, sweet oily kernel; from one pound of which, five ounces of an excellent oil may be obtained, by expression.

2. The *Sylvestris*, or *Scotch* FIR. ....See FIR.

3. The *pinea*, or STONE PINE, is a tall evergreen, growing naturally in Spain and Portugal. It delights in sandy loams; though, like the rest of the pine-family, it will thrive in any soil. The kernels produced by this species, are eaten in Italy, among other articles of the dessert, being preferred to almonds: they are reputed to be serviceable in colds, coughs, consumptions, &c.

4. The *Abies*, or *Spruce* FIR; and,

5. The *picea*, or *Yew-leaved* FIR....See FIR.

6. The *Cembra*, or PINASTER. ....See ARVENUSLY.

All the species of the pine are hardy trees; and, as they not only require a similar culture, but are also infested with the same vermin, the reader will find these subjects concisely stated, under the article FIR-TREE.

From this genus of trees is extracted the common turpentine, which, on distillation, affords the oil known under that name; the process is performed in the following manner: Early in the spring, the bark is pared off the pine-tree, in order that the sap may flow the more freely into the vessel placed for its reception. This is the common turpentine, which is fit for immediate use: after the sap has ceased to flow, the tree is cut into billets, which are thrown into a pit, where they are set on fire: during the ignition, a black, thick matter sinks to the bottom, whence it is conducted into a proper vessel. Such liquor is known by the name of TAR, which is poured into barrels for sale; but, if designed to be made into PITCH, it is boiled in large cauldrons, without the addition of water, or any other fluid; and, on becoming cool, it concretes into a hard black mass.

[The following species of *Pine* are natives of the United States.

1. *Pinus echinata*, three leaved prickly-coned bastard pine: grows in Virginia.

2. *P. Palustris*, Longest three Leaved Marsh-Pine: a native of South Carolina, and is equal to any for yielding tar.

3. *P. Rigida*, Common three Leaved Virginia Pine: a common species in the United States, rises to the height of sixty feet, much used for sawing into boards.

4. *P. Strobus*, New-England White-Pine....One of the largest American trees. Dr. BELKNAP

stiles it the "prince of the American forest, in size, age, and majesty of appearance." It abounds in the New-England states. Great use is made of the timber for masts, yards, and bow-sprits of ships. It is also sawed into boards, which are much used for inside work of houses. The grain is smooth, and when free from knots, does not injure the workmen's tools; but the softness of its texture subjects it to shrink with the weather. Shingles are also made of this tree, and are thought to be as good as those of cedar. The saplin-pine though of the same species is not so firm and smooth as the white pine, and is more sensibly affected by the weather.

Dr. BELKNAP, has given a very excellent account, of the mode pursued in felling this tree in New-England, and of the measures taken to transport it.

5. *Tæda*, Pitch-Pine, or Virginian Swamp, or frankincense pine.

This grows to a pretty large size, and is the largest and heaviest of all the pines. It is chiefly used for fuel, and for making charcoal; its knots being full of turpentine, afford a light surpassing candles. Its soot is collected, and used for lamp-black. It also yields tar, and is sawed into boards: and makes strong planks for vessels.

6. *P. Pinea*, or Yellow-Pine: is harder and heavier than the white, but never grows to the same size. Its planks and boards are in great demand for decks, of ships, and floors of houses.

7. *P. Virginiana*, Spruce-Pine or Two Leaved Virginian Pine. Is of low growth, but divided into many branches.

8. *P. Larix* or larch tree, is the only tree of a turpentine quality which sheds its leaves in Autumn. The turpentine which distills from it, is equal to Burgundy pitch. There are the following varieties of this tree. 1. *Rubra* with red cones. 2. *Alba* with cones of a greenish white colour. 3. *Nigra* with dark coloured cones.

9. *P. Abies Balsamea*; Balm of Gilead fir tree, yields a fine balsam which is contained in small blisters on the bark. The wood is courser, and more bitter than the other species, and is scarce ever sawed or hewn.

10. *P. Abies Canadensis*, Newfoundland spruce. There are three varieties, distinguished by the colour of their cones, which are white, red, and black. The grain of the wood is twisted, and makes bad fuel owing to its continual snapping. The young twigs of the black spruce are boiled till the bark may be stripped from the wood, and being sweetened with molasses, makes a pleasant summer drink. Of this spruce is made the essence, which is as well known in Europe, as in America.

11. *P. Abies Americana*, *Hemlock*, Hemlock spruce fir-tree.... grows to a great size, especially in swampy ground, and is very straight. Its grain is coarse, and is not easily split, but is sawed into planks, joists and laths. It holds a nail well, but if put in a house unseasoned and exposed to alternate moisture and dryness, it rots in the course of two years. This fact has been already noticed when treating of *houses*, but it was also stated that young, well seasoned hemlock, was as durable as most other timber. The bark is used for tanning; it communi-

cates a reddish appearance to the leather, and if used alone, *burns* the leather. The Indians dye their splints for baskets, of a red colour with it. The balsam of the hemlock is used in medicine, but is sparingly collected.]

PINK, or *Dianthus*, L a genus of plants consisting of 28 species, six of which are indigenous, viz.

1. The *Armeria*, or DEPTFORD PINK, which grows in gravelly meadows, and flowers in July or August.

2. The *Barbatus*, or SWEET-WILLIAM.

3. The *Prolifer*, PROLIFEROUS PINK, CHILDING PINK, or SWEET-WILLIAM.

4. The *Caryophyllus*, COMMON PINK, or CARNATION. See CLOVE-PINK.

5. The *Deltoides*, or MAIDEN PINK.

6. The *Cœsius*, or MOUNTAIN PINK. It is perennial, and flowers in the month of July or August.

All these species are beautiful plants, very generally cultivated in gardens, on account of their fragrance. They are propagated by seeds, as well as by slips, and layers; the latter of which should be planted three inches apart, towards the end of July, in shady borders that have previously been well dug and moistened. Should the weather prove dry, it will be necessary to water the slips, &c. daily, till they have taken root: after which no farther care will be required than to clear them from weeds, and to transplant them in autumn to those borders which they are designed to decorate.

Florists bestow uncommon pains on the culture of these elegant flowers, which they have divided into seven classes, and these again into varieties, of which there appear to be several hundred. The limits of our work, however, do not permit us to give a catalogue, even of those pinks which, for the uncommon beauty of their variegated shades, are the greatest ornaments of the garden. Hence we shall briefly state the most effectual methods lately discovered, of destroying the insects, and especially the *green aphis* or plant-louse, with which these flowers are peculiarly infested. One of the most simple expedients, is that suggested by a German florist, J. C. WENDLAND, and which has been uniformly successful. In the spring, when the grass has attained the height of 4 or 5 inches, he places his flower-pots, containing pinks or other delicate plants, attacked with the green aphis, in a lateral direction on the grass, so that one side of the former comes in contact with the tops of the latter. When no frost or rime is to be apprehended, this posture is most effectual in the evening; though it should not be attempted with green-house plants which, in general, are less hardy than the pink. After lying in such situation for 24 hours, he turns his flower-pots toward the opposite side, in order that this likewise may be touched by the blades of the grass; and thus he inverts them for three or four successive days. If a frosty night should intervene, he defers to expose his flower-pots in the grass, till the succeding morning, and removes them to the green house in the evening. By this management, the insects disappear, mostly on the second exposure, or at the far-

thest, on the third; but the turning of the pots should, on no account, be neglected.

Another method of exterminating the plant-louse on pinks, consists in fumigating the stocks early in February with the smoke of tobacco, and repeating this process in the green-house every fortnight, till they are removed to the open air of the garden. Sprinkling the young plants with a decoction of wormwood, has also been found a very efficacious remedy against those destructive vermin. See also INSECTS ;.....PROPAGATION ; and SEED.

PIPPERIDGE-BUSH. See BERBERRIES.

PISMIRE. See ANT.

PLAGUE, or *Pestis*, is one of the most fatal disorders that have often depopulated extensive regions of the earth: it is defined to be a very contagious, nervous fever, attended with extreme debility.

In the year 1665, nearly 100,000 persons died of this destructive malady, in the metropolis alone; and as the commercial intercourse between this country and the Levant, renders the British ships and shores every year liable to contract this virulent contagion, which, if neglected on its first appearance, *might be* productive of dreadful consequences, we shall state the mort striking indications of its presence, together with an account of the remedies that have been employed with the greatest success. The first symptoms are, thirst, stupor, giddiness, and violent headach; a stiff and uneasy sensation, accompanied with redness and tumors about the eyes, which shed involuntary tears; the appearance of white pustules on the tongue; and, sooner or later, the eruption of carbuncles on the body; anxiety; palpitation of the heart, which; as well as the liver, becomes preternaturally enlarged; uncommon fetor of the breath; nausea; vomiting of bile; livid spots appear on the whole body; violent hæmorrhages, and, at length, a total prostration of strength.

Various causes have been assigned for the origin of this mortal scourge. Dr. CULLEN supposes it to arise from a specific contagion, which produces a general putrescency in the fluids, together with a sudden debility of the moving powers, or of the nervous system. Dr. RUSSEL also ascribes it to a pestilential contagion; but the following may be classed among the most obvious causes contributing to induce that disorder; namely, corrupt or damaged grain, putrid fish, or other animal substances; noxious exhalations arising from stagnant waters; residence in confined situations, where the current of air is obstructed; and, lastly, want of cleanliness,

The plague attacks persons of all ages and sexes indiscriminately, though some instances have occurred, in which certain countries and persons were exempt from its influence. Thus we are informed by CHARDIN, HALLER, and other writers, that it is unknown in Persia, as well as in Japan. Nor are the gouty and dropsical subject to its attacks; and it appears from a variety of instances, that curriers, [oilmen, and water-carriers] are likewise exempt from its contagion.

The plague rages most violently in the summer, especially during the increase of the moon; its effects are somewhat diminished in

autumn ; and, during the winter, it is greatly reduced, or totally suppressed. No precaution, however, can secure any person from a second attack, as many have survived two, and even three visitations of this malignant disease.

If the plague should unfortunately break out in any particular family or place, those who are obliged to have any intercourse with the latter, must carefully avoid to come in contact with the infected, or with any article that has passed through their hands. Such however, as are induced to attend on the sick, ought to adopt the precautions already stated under the article INFECTION ; to shun intemperance of every kind, and not to indulge in fear, or any of the depressing passions. Moderate exercise ; frequent bathing in cold water ; gentle purgatives ; fumigations ; the prudent use of wine and spirituous liquors ; and, lastly, tonic and antiseptic medicines, especially the Peruvian bark, and camphor, have occasionally been found effectual preservatives.

Cure....The remedies are as various as the causes producing the disorder. Bleeding, gentle laxatives, and mild emetics, have been employed with advantage, both in the earlier and advanced stages of the plague. Camphor, sudorifics, particularly opiates, when combined with small portions of neutral salts ; the Peruvian bark, and acids, have all proved of great service.

Beside these general remedies, there are certain *specifica* which seem to deserve attention. In some, observations lately published by M. GERSONIUS, a Swedish physician, on the plague that depopulated Tunis, we are informed, that the remedies he employed with the greatest success, were the flowers of the German Leopard's-bane, and purified opium.

The most successful remedy, however, that has hitherto been discovered for curing the plague, is *friction of the infected with warm olive-oil*, which we have incidentally mentioned in p. 160 of the present volume. It was first suggested by Mr. BALDWIN, late British Consul General in Egypt, and then adopted by Father LUIGI DI PAVIA, who has exposed himself for nearly 30 years to infection, by his philanthropic and unceasing attendance on such as were attacked with this dreadful malady.

As soon as the first symptoms of infection are perceived, the person thus afflicted should be removed to a close room, and placed over the frame of a vessel containing hot coals ; while his body is rubbed very briskly with a *clean* sponge dipped in *warm* olive-oil, in order to excite a profuse sweat. During this operation, it will be necessary to burn sugar and juniper-berries, as these will produce a thick smoke, and greatly promote the effect. Such friction, however, ought not to exceed three or four minutes ; as it will, in general, be followed by copious perspiration ; but, in the contrary case, the body must be wiped with a warm, dry, cloth ; tepid drinks, such as elder-flower-tea, &c. should be administered to the patient ; and the rubbing once every day continued, till the disease assume a favourable appearance.

The proportion of oil to be employed at each friction cannot be ascertained with precision ; but, in general, a pint or pound was sufficient : its salutary effects are not merely confined to the cure of persons infected with the plague ; but

it is likewise successfully used as a *preventive*. Hence Father LUIGI directs the attendants to rub themselves in a similar manner, previously to their attempting the unction of others; to avoid the current of the patient's breath; and *not to entertain the least apprehension of becoming infected*. Farther, they should adhere to a very abstemious diet; refraining from all food and liquors that may inflame the blood, and excite the passions.

On account of its extreme importance, we have discussed this subject at some length; for, if *olive-oil* be thus efficacious, both in curing and preventing the plague, it is highly probable that it may also be employed with the happiest effect, in other infectious disorders.

PLANE-TREE, or *Platanus*, L. a genus of trees, comprising two species, viz.

1. The *orientalis*, or Eastern Plane-tree, which is a native of Asia, and the Levant, where it attains a stupendous height, so that it is usefully employed in ship-building.

2. The *occidentalis*, or Western Plane-tree, which is indigenous in Virginia, and other parts of North America, where it grows to an uncommon size; instances having occurred of trees measuring eight or nine yards in circumference; and which, when felled, produced twenty loads of wood.

Both these species are highly esteemed for their beautiful and majestic appearance: and, though their leaves decay early in autumn, they are industriously cultivated in their native countries, especially along public walks, and other places of resort, on account of their agreeable, cooling shade.....The plane-tree is very hardy, and will flourish in any common soil or exposure: it may be easily propagated by seed, cuttings, or layers, which should be committed to the ground in autumn. For this purpose, the soil ought to be somewhat moist, and in a shady situation; it should be formed into beds about four feet in width, which must be well dug and raked for the reception of the seed, cuttings, &c. These should be placed four inches apart: in the succeeding spring, the young plants will appear; and, at the end of one or two years, they may be removed into nurseries, where they are to remain, till of a sufficient size to be finally transplanted.

This deciduous tree, particularly the American species, grows rapidly, and is one of the greatest ornaments of modern plantations: its wood is excellent for various articles of domestic furniture, especially for tables; because, at a certain age, it abounds with veins, and when rubbed with oil, surpasses in beauty that obtained from the finest walnut tree....The dry leaves and branches of the Western Plane-tree, according to DAMBOURNEY's experiments, afforded a decoction of a very bright red-brown tint; which, on adding different ingredients, either assumed various shapes, or remained unaltered; so that they may with advantage be employed in dyeing.

PLANT, an organic fibrous body, consisting of roots and other parts: though capable neither of sensation nor spontaneous motion, it attaches itself to other bodies, in such manner as to derive nourishment from them, and to propagate itself by seeds.

The constituent parts of plants

are the roots, stems, branches, rind or bark, leaves, flowers, and seeds; which greatly vary, both in figure and size, according to the nature of particular trees, shrubs, &c.: as, however, the principle of vegetation is throughout analogous, we forbear to enter into a minute description of the various appearances, that have induced botanists to divide the vegetable kingdom into orders, classes, genera, species, and varieties.

All plants, however minute, are propagated by seed: and so easy is their cultivation, that in many instances they may be reared by parting their roots, or depositing layers, cuttings, &c. of the parent-stock, in such soils as are most congenial to their nature. Hence botanists consider them as an inferior class of animals; a conjecture, that is strongly corroborated by the regular circulation of the sap throughout all their parts; and by the *sleep* of plants, or the faculty which they possess of assuming, at night, a position different from that in which they appeared during the day..... This opinion, respecting the animal life of plants, has been carried to a still greater extent, by an eminent philosopher, whose name we have frequently cited, and who has minutely described the absorbent and umbilical vessels; the pulmonary and aortal arteries; as well as the veins, muscles, nerves, brain, and other parts relative to the physiology of vegetation.

A simple method of conveying shrubs, and young trees, from distant climates, has lately been published by M. CHARPENTIER DE CAUSSIGNY. He directs a box to be provided, of a sufficient capacity according to the number of plants intended for transportation. Some light earth, moderately moistened, is then to be spread at the bottom, to the thickness of fifteen lines, or from one to two inches. The young trees should now be taken out of the ground, together with their roots, and the soil adhering to them: after cutting off the extremities of the roots, and also of such branches as are in a growing state, they must be carefully placed between two strata of earth; when the box should be closed. As the plants are apt to become dry during the voyage, in consequence of which their vegetative principle would be endangered, it will be necessary to perforate the lid of the box with several holes, through which they may occasionally be supplied with water; and then be closed with wooden pegs, in order to secure the plants from the effects of cold and moisture. This method has been successfully practised by M. DE C. with the most delicate shrubs, which uniformly prospered after having lain several months in close boxes.

[The reader will find ample directions for bringing over plants from foreign countries, in the excellent work by Dr. LETTSOM, entitled "*The Traveller's and Naturalist's Companion*," London, 1801.

PLANTS, to *naturalize*. In the *Trans. of the Irish Academy*, vol. 7, Mr. J. TEMPLETON has inserted a paper on the naturalization of plants, which will be of use to those who are disposed to make experiments. Among the hints suggested, Mr. T. says, "When we endeavor to naturalize plants, that we may distinguish those which offer the fairest prospect of success, a comparison of the exotics with the natives of the soil, will be our surest guide. Thus we find, that

throughout the frosty regions of the north, the trees, shrubs, bulbous and perennials, complete their shoots, and, before the cold of the winter commences, enclose, in *hybernacula* or scaly buds, the embryo for the coming year. And there is every reason to *believe that* all *exotics which cease growing, and form these buds* or *hybernacules in the open air during the course of our summer*, will not suffer from the severity of our winter. In the hot-house, many plants complete their shoots, that would not probably do so in the open air, the heat not being sufficient to cause them to grow with the vigour necessary for their completion before winter. Nevertheless, many of these, if not all, might be brought, by enuring them to the open air, to bear our climate.

"The *Camelia Japonica*, *Thea-virides* (green tea) and *Calycanthus precox*, which were formerly kept in the hot-house, and in the green-house, are now sufficiently naturalized to grow in the open air, and are as little injured with the cold of our winters, as either the common or Portugal laurel."

These rules, though they admit of exceptions, are in general true, and are worthy the attention of the curious....As an instance of the disposition of plants, to accommodate themselves to the climate to which they are removed, may be mentioned that of the *Franklinia*.... This tree was brought by Mr. BARTRAM before the revolutionary war, to his garden, near Philadelphia, and it flowers one month later than in its native spot.]

Consistently with, and prior to the Linnæan classification, plants have been divided into *male*, that is, such as produce no fruit, possessing only the *farina*; and into *female*, or those which bear fruit, and also have the *pistil*, while they are destitute of the farina. And, as the fecundating dust is specifically heavier than the air, provident Nature has so arranged their organization, that in those plants, the pistils of which are larger than the stamina, the flowers are spontaneously nodding, in order that the farina may be more easily received. For a similar purpose, in aquatic plants, or such as naturally vegetate under water, the flowers emerge above the surface a short time before they blow. There are, however, many vegetables, in which the anthers or males bend into contact with the stigmas or females; and, as the former recede, others approach....We could pursue this account of the *amatorial attachment* of plants to a greater extent, if it were compatible with the design of this work....See also BOTANY; BULB; LEAVES; PLANTING; and TREE.

PLANT-LOUSE, PUCERON, or VINE-FRETTER, *Aphis*, L. a genus of insects, comprising many species and varieties, all of which are denominated from the plants they infest. Their rostra or beaks are inflected; they are provided with four erect wings; and the abdomen terminates in two horns, whence the juice, known under the name of HONEY-DEW, is said to be ejected.

These insects are extremely prolific, depositing their eggs on the buds, leaves, and even the stems of plants; into which they thrust their minute beaks, and thus extract their sustenance.....As the vine-fretters are uncommonly numerous, these punctures being continually repeated, disfigure the

leaves, and otherwise materially injure the plant. Various means have therefore been contrived, with a view to prevent their depredations, and to extirpate these vermin....Under the articles INSECTS, and PINK, we have already stated the most successful methods practised by gardeners for this purpose: hence, we shall only observe, that such insects appear to be generated chiefly by an improper management both of the soil and plants; namely, by employing crude manure, whether of animal or vegetable substances, not sufficiently putrified; by the use of stimulating liquids, such as bullock's blood, the water collected from farm-yards, and similar preparations; by the want of fresh air, or by excluding the young plants from the benefit of the dew, and the solar rays:..... for it has been remarked, that vegetables, constantly exposed to the influence of the atmosphere, are not liable to be materially injured by plant-lice.

Mr. FORSYTHE recommends two parts of fine wood-ashes to be mixed with one part of unslacked lime, reduced to powder; which must be thrown on the *under-side* of the leaves infested with the insects, by means of a common *dredging-box*, till they are completely covered. This mixture should be applied early in the morning, before the dew is evaporated, that the powder may adhere more firmly; and which must farther be suffered to remain on the leaves, for three or four days.

Unslacked lime is then to be incorporated with soft water, in the proportion of half a peck to 32 gallons; and the mixture stirred two or three times in 24 hours, for three or four successive days. After the lime has subsided, the trees must be copiously watered with this liquid; care being taken to throw a considerable part of it on the lower side of the leaves. The irrigation must be repeated once every day, for a week; a practice by which the plant-lice will be effectually destroyed.

PLANTAIN, or *Plantago*, L. a genus of plants, comprising 39 species; the following of which are indigenous, and deserve attention.

1. The *major*, GREATER PLANTAIN, or WAY-BREAD, is perennial; grows on road-sides; and flowers from June till August..... According to Dr. WITHERING, the country people apply the bruised green leaves of this vegetable to slight wounds.....Cows and horses do not relish the plant, but it is eaten by sheep, goats, and swine.

[The following paragraph appeared in a Virginia Gazette, of last year, (1802); no name was attached to it, but the facts are so clearly stated, that it is deemed worthy of preservation.

"Some weeks ago, a gentleman in this city was bitten above the knee by a spider. This was about day-break, when he was in bed. He felt a slight puncture, like that of a pin; but did not pay attention to it. In a few minutes, he observed a pain shooting upwards from the spot, which presently reached his heart. On turning up the bed clothes, he perceived the spider. Fortunately he sent for a friend, who was acquainted with a cure for the poison. This was Plantain-leaf. As an additional piece of good fortune, his friend knew where a quantity of it was growing. Some leaves were immediately got, and the juice bruised out of them. This was swallowed in mouthfuls. The progress of the

poison was stopt; and finally a cure was effected. The gentleman said that, but for this remedy, he did not think he could have survived an hour longer. Some oil was also poured down his throat, but plaintain-leaf had the entire credit of his recovery. He was dreadfully weakened, and it seems almost inconceivable, how much the whole mass of the blood had been corrupted by the bite of so small an insect. We had these particulars from the gentleman himself, who called at this office, on some business, a few days afterwards. Some years ago, a gentleman in this neighbourhood, was also bitten above the knee, by one of those venomous creatures, and was almost in danger of losing his leg. It ought to be a general rule to kill all such vermin, whenever they come within reach."]

2. The *lanceolata*, RIBWORT-PLANTAIN, or RIB-GRASS, is also a perennial plant, very common in pastures, and flowers in the month of June....LINNÆUS remarks, that this herb is eaten by horses, sheep, and goats, but wholly refused by cows; though the richness of the milk in the noted Alpine dairies, is, by HALLER, attributed to the nutriment derived from this plant, and the Common LADIES-MANTLE. ....The former is often cultivated for pasturage, but does not answer the purpose, unless combined with clover or other grasses. The total absence of rib-grass, in marshy lands, is a certain criterion of their indifferent quality; and, in proportion as such soils are improved by draining, this plant will flourish and abound.....Dr. WITHERING observes, that when it grows detached from other grasses, for instance, by the sides of foot-paths, he has never known cattle to touch the Ribwort-plaintain; but that they certainly eat it, when mixed with other herbage.

3. The *Coronopus*, BUCKSHORN-PLANTAIN, STAR-OF-THE-EARTH, or HARTSHORN, grows on gravelly soils, near the sea-shore; and flowers from June till August..... There are two indigenous varieties of this species; namely, the Common Buckshorn, which abounds on heaths; and the Narrow-leaved Welch Plantain, that flourishes on the mountains of that country.... Both afford wholesome food for horses; and BECHSTEIN informs us, that they have in Germany, been used with great success for curing the bite of a mad dog, as well as that of other raving animals.

PLANTAIN, the GREATER-WATER, or THRUMWORT, *Alisma Plantago*, L. a native perennial plant, growing in watery places, on the banks of pools and rivers; and flowering from July to August ....This acrid and poisonous vegetable is extremely deleterious to sheep and cattle: hence it ought to be carefully eradicated in the spring, or summer, before it can be farther propagated by its seeds.

PLANTATION, a term denoting, in general, a tract of land assigned to a planter, or person who engages to settle in a new colony. It also signifies a particular spot of ground planted with young trees, in order to form a wood or forest.

Plantations may be established on moors, and other indifferent soils, after the ground has been drained, or otherwise prepared for the reception of trees, in the usual manner. If the land be fertile, it should previously be ploughed; a small portion of lime scattered;

and a brake-harrow passed over the soil, with a view to destroy the couch-grass: by this easy management, the ground will not only be completely cleared, but considerable trouble will thus be avoided for the future....When the soil is reduced to a proper state, it may be planted with trees, that ought to be from four to six feet in height, and to be placed about eight or ten feet asunder, in such situations as may be most congenial to their respective nature. The ground should be hoed three or four times in the year; and, during the interval, those plants which stand too closely together, may be advantageously removed to other situations, where they are sheltered. This practice cannot fail of being attended with the greatest success: for the plantation will, in the course of seven years, produce sufficient foliage to shade the ground; and, as the dry couch-grass, or other weeds, will be prevented from causing any injury, the farther application of the hoe will become unnecessary.

Independently of the great value of plantations to posterity, they afford immediate advantages to their possessor. Where two or more trees interfere, and thus mutually obstruct their growth, the most thriving should be reserved, and the others felled for underwood; but, if such expedient should render the plantation too thin, it will be sufficient to *pollard*, or lop the tree of inferior quality; and, if it be a larch, or spruce-fir, to *trim* the part that impedes the growth of its neighbour. This operation, however, ought to be regularly performed at an *early* period, because there will otherwise be no underwood; nor will the principal trees acquire a substance proportioned to their height; and, if the *thinning* be decayed, they will be unable to resist high winds. Such trimmings may be advantageously employed during severe winters, in feeding cattle, that will eat leaves, together with the twigs, or small branches: the refuse, or poles, when barked, may be cut into billets for fire-wood, or they may be converted into rails, for fencing.

PLANTING, in gardening and agriculture, implies the setting of a plant or tree; which, on being removed from its former place, is fixed in a fresh cavity proportioned to its size.

The best season for transplanting is, from November to the end of February; because the generality of plants, trees, shrubs, &c. during those months, are in a dormant state, and receive little injury from their removal; provided the weather be *open*. The quality of the soil, as well as the climate, situation, and exposure, should therefore be relatively consulted. It will also be necessary to mark the sides of the plants on which they are exposed to the sun, and to place them exactly in the same direction; for otherwise the circulation of the sap will be prevented, and their growth consequently impeded. Farther, the roots must be properly spread before the plant is settled in the ground, when a portion of fine mould should be strewed over them; and, on being sprinkled with water, the whole ought to be closely pressed down, to the consistence of unbroken earth....A piece of long stable-dung, or a little sawdust, or the *shaws* of hemp or flax, should next be scattered on the

spot, in order to prevent the roots from being injured by the frost; and, if the plants do not stand closely together, it will be advisable to support them with stakes, during the first year at the least; such stakes, however, must be carefully fixed in a triangular direction, inclining towards the tree at the top, in an angle of 30 or 40 degrees; and at such a depth, that they may not interfere with the roots. It will also be proper to insert a few *battens* between the posts, and to intertwine them with small birch, or other twigs, that will not damage the bark, while they admit a free passage to the rain-water: by this simple contrivance, the bark is at the same time effectually secured from the rot.

In the 4th volume of *Annals of Agriculture*, we meet with an interesting account of the cheapest mode of planting, which was accidentally discovered by JAMES BARNARD, Esq....It consists simply in ploughing up new land, and sowing the seeds of the Scotch fir, together with oats. The crop of grain will, according to his computation, repay the expence of ploughing; and no farther trouble will be required. Thus, the most barren spots, though overgrown with furze, may be converted to the greatest profit; for, as the seeds of the latter continually vegetate in the soil, they will speedily grow up, and shelter the young firs, till they at length *overtop* the furze, which will eventually perish, while a stock of thriving plants will be obtained.

PLASHING of HEDGES, a term employed by farmers to denote an operation, which is performed on quickset hedges at certain seasons, with a view to assist their growth, and promote their durability. For this purpose, the principal stems should be selected to serve as stakes, at proper distances, the tops of which are to be cut off at the height of four feet from the root; the straggling side-branches of the other part of the hedge must also be lopped, and several of the remaining shrubs separated closely from their roots; after which, the rest are transversely cut half way through, so that they may be bent to one side. These are next inflected in a position nearly horizontal, and interwoven with the upright stakes, in order to retain them in that situation. Farther, where hedges have been deformed with *gaps*, the divided quicksets ought to be laid very low at those particular spots, which should be supported by the addition of some dead stakes, or truncheons of willows. These wattlings will continue to vegetate, sending forth shoots from their stems; and, as the upright branches that arise from the stakes (the tops of which had been cut off) in a short time force themselves upwards through the hedge, they will unite the whole into an entire body, so as to constitute a strong, durable, and elegant fence.

The operation of *plashing* is sometimes performed in October, but more generally in the month of February or March; which latter season is the more eligible, because the divided plants will not be materially injured by the vernal frosts....[See HEDGE.]

PLASTER, an external application of a more solid consistence than ointments, and which is usual-

ly spread on linen, leather, or tow, according to the nature of the wound or ulcer.

Plasters are prepared chiefly from unctuous matters, which are combined with powders, so as to retain their firmness when cold, without adhering to the fingers; though becoming soft and pliable in a low degree of heat, and acquiring sufficient tenacity from the warmth of the human body, to adhere to the part to which they are applied.

London court-plaster: Dissolve the best isinglass (previously cut in small pieces) in any proof spirits, so as to obtain a strong viscid solution; then take taffety, or other thin silk, and spread the liquor uniformly over it, with a soft brush: when the first coat is perfectly dry, repeat this application a second and third time, till at length the whole surface should be sparingly anointed with Peruvian balsam....Others prepare this noted plaster, by dissolving equal parts of storax in the cane; benzoin, the resin; and isinglass, in spirits of wine: these ingredients are to be digested in a glass retort, placed in a moderate heat for twenty-four hours; when the solution is filtered, and applied while lukewarm, in a manner similar to the preceding, but without any balsam....See also WART and WOUND.

PLASTER OF PARIS....[See GYPSUM.]

PLATINA, one of the most precious metals that was discovered in South America, about the middle of the eighteenth century. It is found chiefly in the river Pinto, and near Carthagena, in small, irregular grains, which are always combined with iron.

Platina retains its metallic lustre, in a manner similar to gold; nor does it become tarnished on exposure to the air: it is, however, extremely difficult of fusion, requiring an intense heat to reduce it to a fluid state. When properly refined, its colour is between that of iron and silver; it emits no smell; is reputed to be the most ponderous body hitherto known; and its specific gravity is, according to Mr. KIRWAN, to that of water, as 23 to 1....Farther, platina is considerably harder than iron; and, remaining equally exempt from the effects of fire and air, it forms the best material for making crucibles. It resists the action of acids, sulphur, and alkalies; and, notwithstanding its uncommon hardness, is extremely ductile, so that it may be rolled into plates, or leaves, like those manufactured from gold; and Dr. WITHERING observed, that the wire platina is much stronger than that of silver or gold of a similar thickness.

Lastly, platina possesses the property of soldering, or *welding*, without mixture, on which account it is preferable to gold. When formed into a mirror, the former metal reflects one image only, while it remains unchangeable like glass.

PLETHORA, or FULNESS, is that state of the human fluids, and particularly of the blood, in which they abound to such a degree, as to prove hurtful to the animal functions.

Young persons that lead an indolent or luxurious life, especially females; as well as those who have hastily suppressed any of the larger evacuations; or whose pursuits have been suddenly changed from an active to a sedentary employ-

ment, are particularly subject to *plethora*;...which is likewise often induced by the indulgence in sleeping, longer than Nature seems to require. Hence the patient becomes languid, weak, and unable to take the necessary exercise for promoting the regular circulation of the blood; the pulse sinks, the action of the heart and arteries is speedily lessened; he becomes affected with violent palpitation, and oppressed with great vertigo, or dulness.

Such are the symptoms that generally prevail in this complaint; beside which, the vessels are frequently distended, and thrown into dangerous commotions. Thus, plethoric patients are peculiarly disposed to fevers, inflammations, hæmorrhages, and a long train of chronical and other diseases; of which they are not easily cured, on account of their singular dislike to avail themselves of proper exercise.

Although *plethora* cannot with strict propriety be termed a disease, yet, as it is the parent of numerous maladies, we deem it useful to state a few hints for the relief of the plethoric. Such persons ought to *adopt a more temperate diet*; to take frequent and moderate exercise, especially by walking early in the morning; to lose occasionally a few ounces of blood, by the application of leeches to the temples; and to regulate the bowels by the mildest cooling laxatives, such as sweet whey, boiled prunes, roasted apples, &c. If, however, the complaint originate from the cessation or suppression of any natural evacuation, the removal of such impedient, together with the attention paid to the regimen above directed, will in most instances restore the patient to his former health and vigour.

PLEURISY, or *Pleuritis*, is an inflammation of the membrane, called the *pleura*, which lines the cavity of the chest, and covers internally the ribs, intercostal muscles, and lungs.

The characteristic signs of this dangerous disorder are, fever; a hard, full, and tense pulse; an acute pain in the side affected, that increases both on inspiring and attempting to lie down; straitness and oppression of the chest; with a painful cough, which is at first dry, afterwards humid, and frequently accompanied with the expectoration of mucus streaked with blood. Those causes that produce inflammation of the lungs are likewise apt to occasion pleurisy; beside which may be mentioned, the disuse of blood-letting, after a person has strangely been accustomed to lose blood, at stated periods; also keeping the body too warm; a plethoric habit, &c.

Beside a most rigorous abstinence from animal food, heating liquors, and every kind of irritation, either by the indulgence in passions, or exercise of body or mind, the first remedy to be employed in a pleurisy, is copious bleeding. Blisters, fomentations, and warm cabbage, or other leaves, have often with advantage been applied to the painful side. With similar success, gentle emetics, and purgatives, have been administered in particular cases; and if the patient neither perspire nor pass any urine, small but frequent doses of camphor and nitre have generally procured relief. In other respects, the treatment, as well as the diet and regimen, varies but little from that already stated un-

der *Inflammation of the* LUNGS, to which article the reader is referred.

PLOUGH, in agriculture, a machine for breaking or turning up the soil, by the draught of cattle.

No implement has more essentially contributed to the comforts of mankind than the plough; for, without this contrivance, much time, labour, and expence, would be wasted, in digging the ground, and preparing it for the reception of seed. Hence, ingenious men have invented a variety of ploughs, but, as a detail of their various constituent parts, would exceed our limits, we shall confine our attention to an account of such machines as deserve more particular notice.

[The great points to be attended to in ploughing, are, 1. to open a fair regular furrow, and 2, to do this, with as little resistance as possible. It is believed that these advantages are to be obtained, by the use of a plough, to which the mould board invented by THOMAS JEFFERSON, is affixed: and of which the annexed views will give a clear idea.

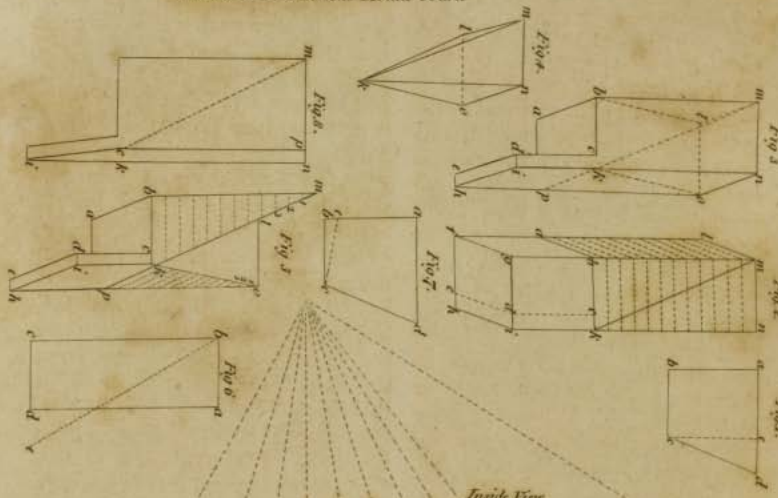
The following account of this mould-board, and of the principles upon which it is constructed, are taken from a communication addressed to Sir JOHN St. CLAIR, in 1798, then president of the British board of agriculture, and inserted in the 4th vol. of the *Transactions of the American Philosophical Society, vol. 4 p.* 314.

"The mould-board should be a continuation of the wing of the ploughshare, beginning at its hinder edge, and in the same plane. Its first office is to receive the sod horizontally from the wing; to raise it to a proper height for being turned over; and to make, in its progress, *the least resistance possible*; and consequently to require a minimum in the moving power. Were this its only office, the wedge would offer itself as the most eligible form in practice. But the sod is to be turned over also. To do this, the one edge of it is not to be raised at all; for to raise this would be a waste of labour. The other edge is to be raised till it passes the perpendicular, that it may fall over with its own weight. And, that this may be done, so as to give also the least resistence, it must be made to rise gradually from the moment the sod is received. The mould-board then, in this second office, operates as a transverse, or rising wedge, the point of which sliding back horizontally on the ground, the other end continues rising till it passes the perpendicular. Or, to vary the point of view, place on the ground a wedge of the breadth of the ploughshare, of its length from the wing backwards, and as high at the heel as it is wide: draw a diagonal on its upper face from the left angle at the point to the right upper angle of the heel: bevil the face from the diagonal to the right-bottom-edge which lies on the ground. That half is then evidently in the best form for performing the two offices of raising and turning the sod gradually, and with the least effort: and if you will suppose the same bevil continued across the left side of the diagonal; that is, if you will suppose a straight line, whose length is at least equal to the breadth of the wedge, applied on the face of the first bevil, and moved backwards on it parallel

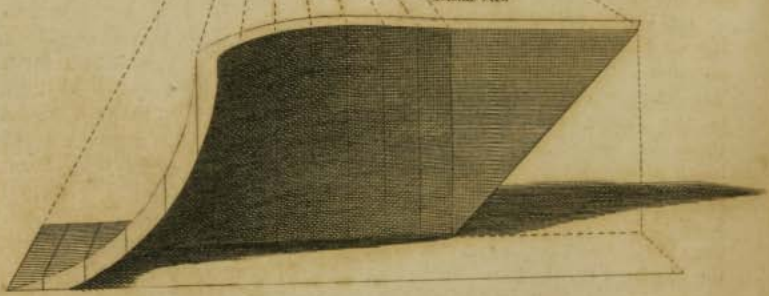
Mr Eckstein's Peat Borer

Fig. 4.

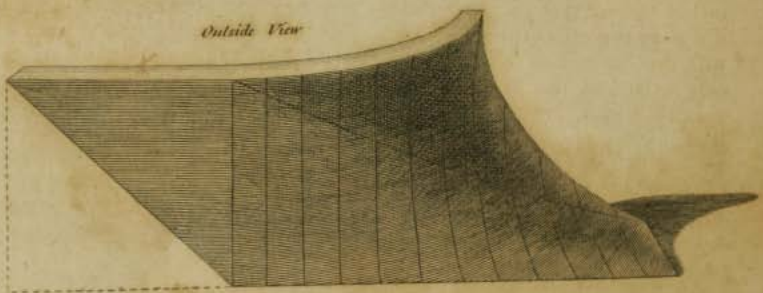
Sections of Mr Jefferson's Mould-board



Inside View



Outside View



with itself and with the ends of the wedge, the lower end of the line moving along the right-bottom-edge, a curved plane will be generated, whose characteristic will be a combination of the principle of the wedge in cross directions, and will give what we seek, the *mould-board of least resistence*. It offers too this great advantage, that it may be made by the coarsest workman, by a process so exact that its form shall never be varied a single hair's breadth. One fault of all other mould-boards is that, being copied by the eye, no two will be alike. In truth it is easier to form the mould-board I speak of with precision, when the method has been once seen, than to describe that method either by words or figures. I will attempt however to describe it. Whatever may not be intelligible from the description, may be supplied from the model I send you.

"Let the breadth and depth of the furrow the farmer usually opens, as also the length of his plough-bar, from where it joins the wing to the hinder end, be given; as these fix the dimensions of the block of which the mould-board is to be made. Suppose the furrow 9 inches wide, 6 inches deep, and the plough-bar 2 feet long. Then the block, Fig. 1. must be 9 inches wide at bottom (*b. c.*) 13½ inches wide at top, (*a. d.*) because if it were merely of the same width with the bottom as *a. c.* the sod, only raised to the perpendicular, would fall back into the furrow by its own elasticity. I find from experience, that, in my soil, the top of the mould-board should overjet the perpendicular 4½ inches in a height of 12 inches, to insure that the weight of the sod shall preponderate over its elasticity. This is an angle of nearly 22°. The block must be 12 inches high, because, unless the mould-board be in height double the depth of the furrow, in ploughing friable earth, it will be thrown in waves over the mould-board: and it must be 3 feet long, one foot of which is added to form a tail-piece, by which it may be made fast to the plough-handle. The first operation is to give the first form to this tail-piece, by sawing the block, Fig. 2. across from *a. b.* on its left side, (which is 12 inches from its hinder end) along the line *b. c.* to *c.* within 1½ inches of the right side, and to the corresponding point in the bottom, 1½ inches also from the side. Then saw in again at the hinder end from *d. e.* (1½ inches from the right side) along the line *d. e.* The block *a. b. c. d. e. f. g.* drops out and leaves the tail-piece *c. d. e. h. i. k.* 1½ inches thick. The fore part of the block *a. b. c. k. l. m. n.* is what is to form the real mould-board. With a carpenter's square make a scribe all round the block at every inch. There will of course be 23 of them. Then from the point *k.* Fig. 2. and 3. draw the diagonals *k. m.* on the top, and *k. o.* Fig. 3. on the right side. Enter a saw at the point *m.* being the left-fore-upper corner, and saw in, guiding the hinder part of the saw along the diagonal *m. k.* (Fig. 2. 3.) and the fore part down the left edge of the block at the fore-end *m. l.* (Fig. 2.) till it reaches *k.* and *l.* in a straight line. It will then have reached the true central diagonal of the block *k. l.* Fig. 5. then enter the saw at the point *o.* being the right-fore-bot-

tom corner, and saw in, guiding the hinder part of the saw along the diagonal *o. k.* (Fig. 3.) and the fore part along the bottom edge of the fore end *o. l.* till it again reaches *k. l.* Fig. 5. the same central diagonal to which you had cut in the other direction. Consequently the pyramid *k. m. n. o. l.* Fig. 4. drops out and leaves the block in the form Fig. 5. You will now observe that if in the last operation, instead of stopping the saw at the central diagonal *k. l.* we had cut through the block in the same plane, we should have taken off a wedge *l. m. n. o. k. b.* Fig. 3. and left the block in the form of a wedge also *l. o. k. b. a. p. k.* which, when speaking of the principle of the mould-board, I observed would be the most perfect form if it had only to raise the sod. But as it is to be turned over also, the left half of the upper wedge is preserved, to furnish on the left side, the continuation of the bevil which was proposed to be made on the right half of the bottom wedge. We are now to proceed to the bevil, for which purpose the scribes round the block were formed before the pyramidal piece was taken out; and attention must be used not to mismatch or mistake them, now that they are disjoined by the withdrawing of that piece. Enter the saw on the two points of the 1st scribe where it has been disjoined, which is exactly where it intersected the two superficial diagonals, and saw across the hollow of the block, guiding the saw, both before and behind, along the same scribe, till the fore part of the saw reaches the bottom edge of the right side, and the middle of the saw reaches the central diagonal; the hinder part will of course continue the same straight line, which will issue somewhere on the top of the block. Then enter the saw in like manner on the two projecting points of the 2nd scribe, and saw in, along the scribe, before and behind, till it reaches the same bottom edge of the right side, and the central diagonal. Then the 3d, 4th, 5th, &c. scribes successively. After cutting in several of the earlier scribes, the hinder part of the saw will issue at the left side of the block, and all the scribes being cut, the saw will have left straight lines from the bottom edge of the right side of the block, across the central diagonal. With an adze dub off all the sawed parts to the bottoms of the saw-marks, just leaving the traces visible, and the face of the mould-board is finished. These traces will shew how the cross wedge rises gradually on the face of the direct wedge, which is preserved in trace of the central diagonal. A person may represent to himself, sensibly and easily the manner in which the sod is raised on this mould-board, by describing on the ground a parallelogram 2 feet long and 9 inches broad, as *a. b. c. d.* Fig. 6. then rest one end of a stick 27½ inches long on the ground at *b.* and raise the other 12 inches high at *c.* which is 4½ inches from *d*, and represents the overhanging of that side of the mould-board..... Then present another stick 12 inches long from *a.* to *b.* and move it backwards parallel with itself from *a. b.* to *d. c.* keeping one end of it always on the line *a. d.* and letting the other rise as it recedes along the diagonal stick *b. c.* which represents our central diagonal. The motion of the cross stick will be that of our rising wedge, and

will shew how every transverse line of the sod is conducted from its first horizontal position, till it is raised so far beyond the perpendicular as to fall reversed by its own weight. But to return to our work. We have still to form the under side of the mould-board. Turn the block bottom up. Enter the saw on the 1st scribe, at what was the bottom edge of the left side, and cut in, guiding the instrument at both ends by the scribe, till it has approached within an inch, or any other distance according to the thickness you choose, of the face. Then cut in like manner all the other scribes, and with the adze dub out the sawed parts, and the mould-board is done. It is to be made fast to the plough by resting the toe in the hinder edge of the wing, which must be made double like a comb-case, to receive and protect the fore end of the mould-board. Then pass a screw through the mould-board and helve of the ploughshare, where they touch each other, and two others through the tail-piece of the mould-board and right handle of the plough, and cut off so much of the tail-piece as projects behind the handle, diagonally, and the whole is done.

" I have described this operation in its simplest mode, that it might be the more easily understood. But, in practice, I have found some other modifications of it advantageous. Thus, instead of first forming my block as *a. b. c. d.* Fig. 7. where *a. b.* is 12 inches, and the angle at *b.* a right one, I cut a wedge-like piece *b. c. e.* off the bottom through the whole length of the block, *b. c.* being equal to the thickness of the bar of the share (suppose $1\frac{1}{2}$ inches) because the face of the wing declining from the top of the bar to the ground, were the block laid on the share, without an equivalent bevil at its bottom, the side *a. b.* would decline from the perpendicular, and *a. d.* from its horizontal position..... Again, instead of leaving the top of the block $13\frac{1}{2}$ inches wide from *m.* to *n.* Fig. 8. I cut a wedge from the right side *n. k. i. c. p. n.* $1\frac{1}{2}$ inches thick at top, and tapering to nothing at bottom; because I find that the tail-piece, being by this means made oblique, as *c. i.* instead of *k. i.* is brought more advantageously to the side of the handle. The first superficial diagonal is consequently brought from *m.* to *c.* and not from *m.* to *k.* as in the first directions."

In a letter (of 19th August, 1803,) with which the editor was favoured from Mr. J. on the subject of his mould-board, he says; " I have since thought of an alteration in the form of that mould-board, which would recommend it more to common opinion, and perhaps improve it. In the one described in the *Phil. Trans.* the toe of the mould-board is at a right angle with the bar, and is lodged in a duplication of the hinder edge of the wing like a comb-case. But I would propose to make that duplication parallel with the fore edge of the fin, and two or three inches back from it, consequently the mould-board would be pointed at the toe, instead of being square. To do this, after the pyramidal block is cut out, the fore-right corner of the block should be sawed off by a line leading from the fore-left corner, paralell with the fore edge of the wing. This being done, the bevil is to be formed by exactly

the same process, as in the first description. The principle of this is rigorously the same with the first; it is only one of those accommodations of it to different circumstances and views, which practice may produce. It will probably enter and pass on with less resistance; but it will at the same time lose a beautiful and advantageous effect, which I observed produced by the first form, which being flat in front like a wedge, the earth of the furrows rising on it, kept it steadily in the ground, without any wabbling, and without any effort of the ploughman. Its motion was as smooth as that of a ship through the water in a steady wind, and smooth surface."

"These variations will be easy to any one after understanding the general principle. While these mould-boards have been under trial, and essays have been making of greater or less projection for the upper right edge of the block, and of different heights in proportion to the depth of the furrow, I have continued to make them of wood. But now satisfied by a sufficient experience, that for a furrow of 9 by 6 inches, the dimensions I have stated are the best, I propose to have the mould-board made of cast iron.

"I am sensible that this description may be thought too lengthy and elaborate for a subject, which the hardly been deemed worthy of has application of science. But if the plough be in truth the most useful of the instruments known to man, its perfection cannot be an idle speculation. And in any case whatever, the combination of a *theory* which may satisfy the learned, with a *practice* intelligible to the most unlettered labourer, will be acceptable to the two most useful classes of society."

Robert Smith, of the Township of Buckingham, Bucks County, Pennsylvania, has obtained a patent from the United States, for a cast mould-board plate, constructed upon mathematical principles, which is much approved of. The editor has been favoured with a copy of the specification, but as no figures explanatory of the progress of the work accompanied it, any description would be unintelligible*. He will therefore only add the following useful remarks by Mr. Smith, on the construction of ploughs.

"In constructing ploughs the beam ought to be placed directly over the land side of the plough, so that the cut of the coulter may be square with the cut of the share; and the land should be given to the plough, between the coulter mortice, and the fore end of the beam: for if the cutting of the share and coulter makes an acute angle in the land, then the plough will incline to fall to the right; but if it makes an obtuse angle, then it will incline to fall to the left. A plough for two horses ought to be not less than nine inches, nor more than ten inches wide in the bottom, and for three horses, from eleven to twelve inches wide. The share should never differ much in width from the plough. The cut of the share and bottom of the plough, should be exactly in one plane. A three horse plough requires no land in its construction. A crook of three

* The patentees agents, are Robeson and Paul, Philadelphia.

inches and a half in the beam, before the coulter mortice to the right, will suffice for the land of a two horse plough. A plough with a long beam runs the steadiest, and it being long, prevents the plough from kicking; and long shafts gives the ploughman a greater command of its direction. The cast iron plate ought to be scoured with a grit stone before it is used."

In ploughing down weeds, or long stubble, it is well known, that much trouble is experienced from the difficulty with which they are completely buried. To remedy this a farmer of Pennsylvania, connected, loosely, one end of a small chain to the end of the large swingle tree, and the other end to the coulter, with the desired effect.]

The *Rotherham-Plough* is too well known to require any description of its various parts: its simplicity, together with the facility of its draught, have recommended it in preference to the unwieldy machines formerly used in Scotland, and various parts of England..... This valuable implement has, within a few years, been reduced in size, and otherwise improved, by Mr. SMALL, of Bosebank; who, we understand, obtained a patent for his contrivance. In its present state, the wood-work is composed of ash or elm; and the plough differs from that commonly used, chiefly in the bridle, with which it is furnished at the end of the beam: this enables the ploughman to give the implement a more effectual power of action, and also by means of certain holes that are made in the beam, to cut the soil to a greater or less depth, as occasion may require. Another peculiarity that distinguishes the Rotherham from the common plough, consists in the *coulter* and *share*, which are so constructed, and fixed, as to cut off the new furrow, without tearing it. Lastly, according to Mr. SMALL'S plan, the mould-board being a plate of cast-iron, is so carved as to make less resistance to the earth turned up, and consequently requires a smaller force to draw it, than the common ploughs; while the furrow is gradually laid over to its proper position....This plough is not provided with wheels; is light and convenient; it costs, we believe, from 40 to 50s; and deserves to be introduced into the southern counties.

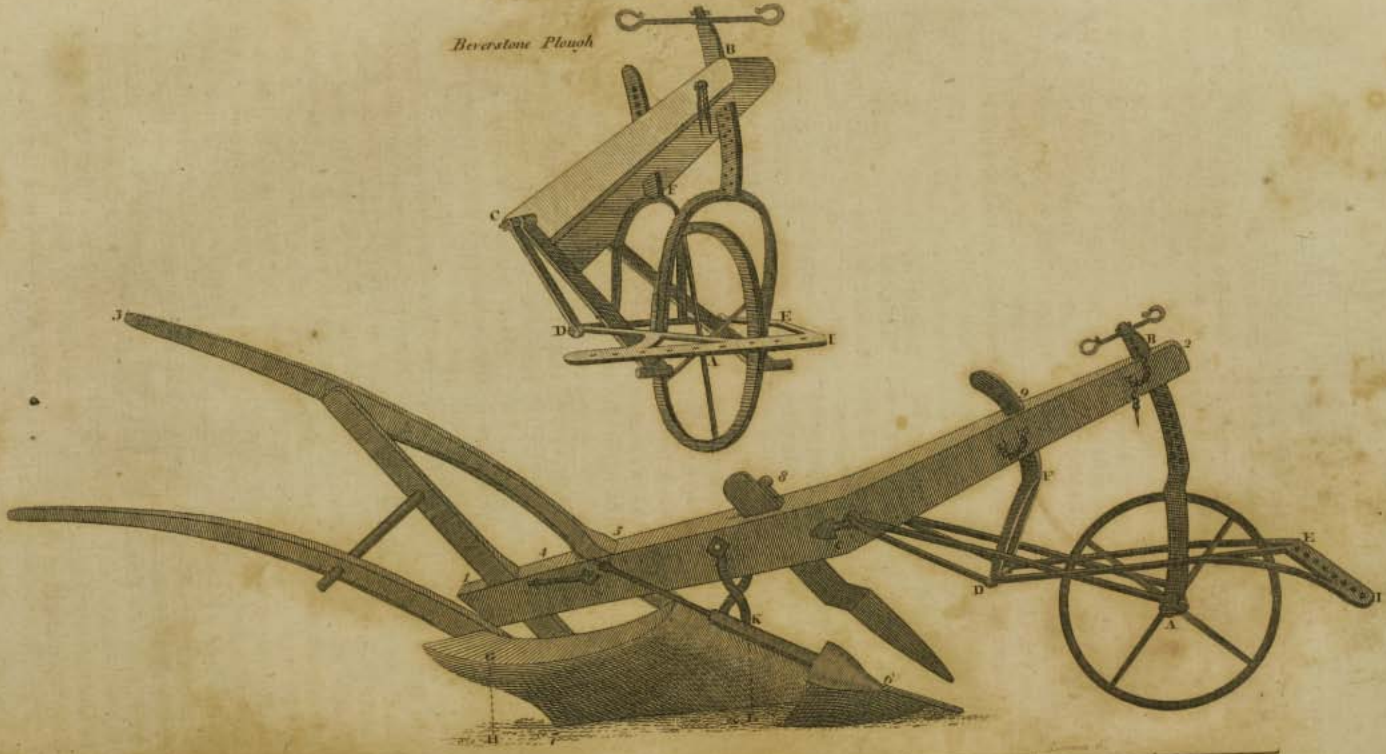
The *Kentish Turn-wrest Plough* consists of an oak beam, about ten feet in length, five inches in depth, and four inches in breadth; to the end of which is *tenoned* a *foot*, or piece of timber ($3\frac{1}{2}$ feet long, 4 inches thick, and $3\frac{1}{2}$ inches broad) that is mortised at the bottom, to the end of the *chep*. The handles are fixed on the top of the beam, through which, at the distance of two feet five inches from the foot, is passed a *sheath* of oak, seven inches in width, and an inch and a half thick, being mortised into the chep in an oblique direction, so that the point of the share will be two feet ten inches asunder from the beam. The *chep* is five feet in length, four inches in width, and five deep: to this is fixed the share, which weighs about 32 lbs. and is manufactured of hammered iron, being one foot eight inches in length, and from four and a half to seven inches wide at the point. The upper end of the beam is supported on a carriage, furnished with two wheels, that are three feet two inches in height; on the axle-tree of which a gal-

lows is placed, and provided with a sliding bolster, for the purpose of raising or lowering the machine. A *clasp-iron* likewise enters through the axle, to which a strong chain, or a *tow* passing over the beam, is fixed in such a manner, that the plough may, by means of notches, or a pin known under the name of a *cheek*, be let out to a greater length from the axle; and will consequently penetrate more deeply into the earth.

We have been induced to give this description of the Kentish Plough, because it is an instument of great strength, and eminently calculated for rocky and hilly countries, as it turns the soil to a considerable depth, laying it perfectly level, without making any furrow, or opening; a circumstance of equal advantage and importance, in dry situations....The price of the drawing, is computed to be about five guineas.

A valuable implement has very lately been introduced into the county of Lancaster, by Mr. Duckett, jun....It is denominated a *Trench-plough*, and furnished with two shares, one being directly over the other, so that one narrow superficial furrow may be drawn from the surface of the soil, while another, at a moderate depth, is taken off beneath. This machine is well adapted for ploughing-in green crops, or long dung, by way of manure; and, if the surface of the soil be *foul*, it may be turned under, and fresh soil brought up, from the deph of 10 inches, by employing three horses. The earth being thus loosened, the roots of plants are enabled to strike downwards without any impediment; and, while the land is drained, and exposed to the influence of the air, it is thereby considerably improved.

The *Scalp-plough*, or *Extirpator*, as it is generally termed, was lately invented by Mr, Hayward, of Stoke-Ash, in the county of Suffolk. Its beam is seven feet in length, and is furnished with two handles. The shares are eight inches broad, nine in length, and are fixed to *stalks*, about ten inches in height, and eleven inches asunder. Such implement may be adapted to the wheels of a common plough, and will penetrate the soil to a greater or less depth, in a similar manner. The object of this contrivance is, the eradication of weeds, and the clearing of ploughed lands for seed; in which respect it is said to be more serviceable than any other instrument. Before the extirpator is employed, the soil ought to be once ploughed; and, if it have lain fallow during a summer, the scalp is passed over it twice; namely, the first time about two inches deep, and the next, in a transverse direction, at the depth of about four inches. This operation, together with harrowing the ground once, will not only destroy all weeds, but will pulverize and prepare the soil for the reception of seed, whether drilled, or broad-cast. Farther, if lands, intended for the production of spring-crops, be ploughed in autumn, and the extirpator be afterwards passed over them, they will be rendered fit for immediate sowing...This machine may be drawn either by two or by three horses, according to the nature of the soil, and the depth required: it possesses the peculiar advantage, that it may be



worked on all arable land, by any person capable of directing a plough, and that it will turn over an acre of ground, in one hour, without fatiguing either horses or oxen....Should the soil, however, be overrun with weeds, it will be advisable to plough it with the scalp, twice; and, in some cases, three times; a short space being allowed to intervene, with a view to deprive the weeds of their vegetating power.

Among the most valuable implements that have, within a few years, been constructed and adopted in this country, is the *Beverstone Plough*, designed, or at least improved, by the ingenious Mr. Lewin Tugwell, of Beverstone, in the county of Gloucester.

[It is believed that this plough has never been introduced into the United States; but as it is highly praised, a plate of it has been annexed from the Annals of Agriculture.]

Dimensions of the Beverstone Plough.

	Feet	*Inches.*
A to B - -	2	4
A.....C - -	2	5
C.....D - -	1	4
D.....E - -	2	5
Diameter of the wheel	1	9
D to F - -	0	11
G.....H - -	0	10½
E.....I - -	1	3½
K.....L - -	0	9
Breadth at the heel	0	9
Breadth of the fin	0	7
Top of beam at the heel to the ground -	0	8½
The mould-board projects at the top, more than the breadth at the heel	0	6
1 to 2 - -	6	0
3.....4 - -	3	8
3.....5 - -	4	3
5.....6 - -	2	5
7.....6 - -	2	8
1.....5 - -	1	5
1.....8 - -	2	10
1.....9 - -	3	8
From the heel to the tuck-hole of the share	2	6½
From the tuck-hole to the point of the share	0	8½

This excellent machine, which considerably varies from the Rotherham, and other valuable ploughs, gained the prize at the *ploughing match* in 1798, held near Pipers-Inn, Somersetshire, under the patronage of the Bath and West of England Society. It may be easily worked by a pair of oxen, without a driver; and, on account of its simplicity, we believe that the representation, now given, will be sufficient to guide a skilful mechanic in the construction of a similar implement.

[Mr. Arthur Young, makes the following remarks upon this plough:

"This plough I saw working, drawn by a pair of oxen, and *without a driver*. The structure of the plough demands several trials. The line 5 K 6, has an easy wedge-like entrance into the ground, and is free from that obtuse angle which is prejudicial in many ploughs; but the depth from G to H being only ten inches and a half, or but an inch and a half more than at K L, should seem to indicate a fitness only for a shallow furrow. But the great question, is, the *utility of* the wheel *apparatus*, and the draught

to a wheel plough not being applied to the axis of the wheel: these points should be ascertained by varied experiments. There are reasons for believing that the draught in ploughs should be above that line. The height of the wheel is a material object in ploughs, as well as in carriages: and of this I know but one conclusive experiment, that of Mr. ARBURTHNOT's drain plough, which by this only, was reduced from twelve to eight horses."

Under the head DRAIN, (vol 2d, p. 363,) an account is given by Dr. WILLICH, of SCOTT's *mole-plough*. We have since been enabled to procure a drawing of this impliment, from which the following cut is taken.

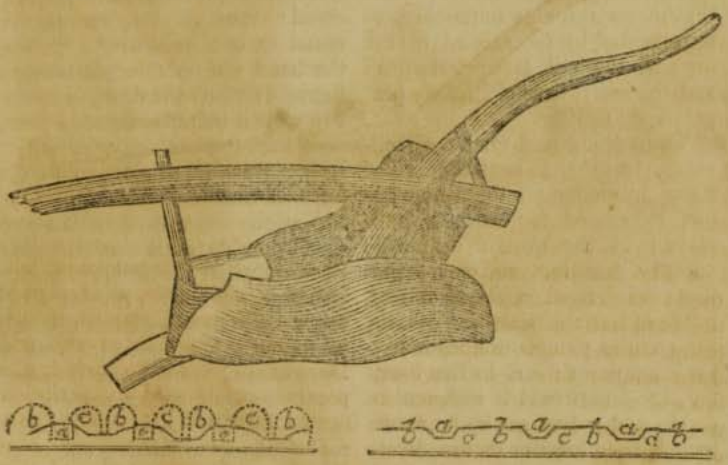
a The handle, one only being used: its length is six feet, and mortised into the beam at *b*; *c* the beam, six feet eleven inches long; *d* the coulter fifteen inches long, ten and a half wide, wedged as usual; *e* the cone or mole made of cast iron, twenty inches long, and two and a half in diameter at its base; having an upright piece of bar iron, two feet long, and three inches and a half broad, with a sharp edge, which passing through the beam at *f*, is held fast by wedges, and the pin *g*, being put through one of the holes in the bar, serves to regulate the depth of the cavity below the surface of the land, the lower side of the beam being in contact with the ground during the working.]

Beside these, now described, several other ploughs have been contrived for particular purposes; but, having already given an account of the most valuable improvements, under the heads of DRAINING, and DRILLING, we shall conclude the present article with a description (extracted from M. SIMONDS's "*Tableau de l'Agriculture Toscane*," 8vo. Geneva, 1801) of two ploughs, that are used in Tuscany, as well as in other parts of Italy; and which, from the simplicity of their construction, deserve to be more generally known.

The first is denominated the *Greater Tuscan Plough*: the sock is an iron plate, somewhat concave, which is from eight to nine inches, both in breadth and in length; it is sharpened on every side so as to divide the soil in an horizontal direction, and with great ease. The coulter is perpendicular upon the

angle of the sock; and a moveable board *(versoir)* is placed flat over the chep, in such a manner as to form a continuation of the sock, and to pass under the clod which the latter has raised: but, as it describes a curve on the side opposite to that of the coulter, it deviates from the line, and is turned upside-down, together with the soil which it has received. The implement, thus constructed, meets with the smallest possible resistance in working the ground; its sock divides the earth with a facility equal to that of a common spade; and, as its motion is continued, it acquires greater power of action than the latter:.....the coulter also, being vertical, passes on with less difficulty than such as are always in an inclined position. Lastly, the Italian mould-board being flat, receives the soil from the sock, which it turns over to the side, without increasing the resistance encountered by the implement, in consequence of this secondary operation.

The *Lesser Tuscan Plough*, of which the following representation will afford a tolerably distinct idea,



is lighter, and more deminutive in all its dimensions, than the preceding. Its sock is of a similar shape, but the coulter is perpendicular beneath its beam, between the course of the sock; and instead of the mould-board (of which this machine is destitute), its broad chep is formed in the shape of a plane *(doloire)*, so as to turn the earth equally on both sides. In order to work the plough, the labourer conducts it between each border *(plate-bande)*, which he divides at a single stroke, thrusting the soil of either side towards the furrow of the preceding year: and, while the latter is nearly filled up, he forms the trench, which is to continue open during the next season; so that the soil is alternately stirred, according to the system of Mr. Tull; being sown one year, and serving as a furrow in the sub-

sequent. This alternation is delineated in the foremost of the two lines, in the cut above annexed; where the lines represent the ground previously to its being ploughed; and the points or dots, its external form, after such operation.

The plough enters at *a a*, dividing each border; and, in throwing up the soil equally on both sides, it forms the small elevations *b*, *c*. Thus, the field presents alternately after ploughing, two ridges adjoining to each other, and then a furrow. Next, the labourer passes a small square harrow over these elevations, which he levels; while the furrow remains untouched, as represented by the second of the lines in the cut last referred to; and the soil is thus ultimately prepared for sowing.

The agricultural reader will observe, from the construction of these implements, that they are not calculated for working stiff clays; as the ground cannot be entirely removed, and some part must even remain untouched. But, in the rich friable soils of Tuscany, the smaller plough is a most useful instrument; for, in that country, the least effort is sufficient to divide and pulverize the land: we have been induced to communicate the figure above-mentioned, chiefly on account of its simplicity, and as there are similar soils in the southern parts of Britain; where, we conceive, the Italian ploughs may be advantageously employed. Lastly, the deep furrows, that remain in the ground after it has been ploughed, present a greater surface to the action of the sun and air; a circumstance materially conducing to its improvement.

We have here given an extensive view of the subject, on account of its *national importance*.....Justice, however, impels us to mention another contrivance, for ascertaining the force necessary in the draught of various ploughs. It was presented to the public by Mr. More, the late ingenious Secretary to the *Society for the Encouragement of Arts*, &c.: it consists of a spring coiled within a cylindrical case, which is furnished with a dial-plate, numbered in a manner similar to that of a clock; and which is so constructed, that the hand moves in consequence of the motion of the spring, and points the numbers according to the force exerted: thus, if the draught be equal to one cwt. over a pulley, the hand will be directed towards figure 1; when the draught equals two cwt. it points to figure 2; and continues to increase, or diminish, its progress in proportion to the exertions made.

Various experiments were conducted under the inspection of the Society, when the accuracy of this machine was fully evinced; a detailed account of which is inserted in the first volume of *Annals of Agriculture*; where the different results are minutely recorded.

PLOUGHING, in rural economy, denotes the stirring and turning over the land with the plough.

This is one of the most essential operations in the culture of the earth, and requires to be performed with the greatest care. Whatever, therefore, may be the design of the farmer, or the destination of the ground, thus moved, it ought never to be ploughed in a wet state; because the soil cannot be improved by such labour. Farther, the plough ought to be carried to a considerable depth into the soil; and, if one turning be not suffi-

cient, it will be advisable to pass another plough over the same furrow, so that the land may be effectually stirred; when, being thus exposed to the air, its fertilizing properties will not only be considerably augmented, but all perennial weeds will be completely eradicated.....Deep ploughing, however, is unnecessary for land that has been recently manured with lime or marle; but, on exhausted soils, it is uncommonly beneficial, and has, therefore, been generally recommended by the most skilful husbandmen.

Ploughing increases the food of plants; as it opens the soil for the reception of vegetable aliment from the air; and, the surface being consequently enlarged, a greater portion of land is thus exposed to its influence. Farther, by *breaking up* the ground, if it be too solid, and rendering it firm, in case it be too light, this operation greatly tends to improve the earth; and, as weeds and other vegetable substances are thus reduced to a state of putrefaction, it promotes the nourishment of the new roots. Lastly, ploughing removes too great humidity, by forming the land into RIDGES (which see), and contributes to the eradication of weeds; as it first causes their seeds to vegetate; and, afterwards tearing up the young plants, exposes their roots to the drought; in consequence of which, they are deprived of their vegetative power.

PLUM-TREE, or *Prunus*, L. a genus of plants, comprising fifteen, but according to BECHSTEIN, thirty species; five of which are reared in Britain, namely:

1. The *Padus*, or BIRD-CHERRY; and,

2. The *Cerasus*, or COMMON WILD CHERRY; see vol. ii.

3. The *insititia*, BULLACE-PLUM, or BLACK BULLACE-TREE, which grows in hedges, and flowers in the month of April....The fruit of this species is of an austere, but pleasant sub-acid taste, especially when it has become mellow by the frost. It is of a dark-blue colour (there is also a variety which is white); of a globular shape; double the size of common sloes; and next kin to plums. In Germany, it is preserved in vinegar and spice; though the Bullace-plum may also be profitably converted into brandy...The wood of this tree is beautifully veined, and highly prized by turners....The bark of the roots and branches has styptic properties; and Dr. WITHERING observes, that an infusion of the flowers sweetened with sugar, is a mild purgative, well adapted for children.

4. The *spinosa*. See SLOE-TREE.

5. The *domestica*, or COMMON PLUM-TREE; which abounds in hedges, where it is supposed to be propagated from stones planted by birds. It delights in lofty situations, and does not prevent the grass from growing beneath its shade...Its bark imparts a yellow dye.

Numerous varieties of this species are raised by gardeners, of which the following are the most remarkable:...1. The *Lord's Plum;* and 2. the *Ladies' Plum;* 3. The *Red Pedrigon;*....4. The *Hungarian*, or *Blue-egg-plum;*...-5. The *St. John's-plum;*....6. The *Royal;* and 7. the *Green*, or *White Indian-plum*. All noticed under article ORCHARD. To these may be added, 8. The *St. Julian*, and....9. The *Magnum-bonums;* which, being very hardy,

are chiefly employed as stocks for raising peaches....10. The *Jean Hative*, or *White Primordian*....11. The *Early Black Damask*, or *Morocco*; which are principally valued on account of their early maturation....12. The *Great Violet Damask of Tours*, that attains a considerable size: externally, it is of a dark-red colour; its flesh is yellow, and possesses a rich saccharine taste.....13. The *Fotheringham*, or *Sheen-plum*; a large fruit, which is equal to any of the numerous varieties, both for beauty, and delicacy of flavour....14. The *White Pedrigon* is in great esteem: it may be used either for sweet-meats, or eaten in a fresh state....15. The *Violet* is a very delicate fruit, but is seldom produced in abundance....16. *Imperial*, or *Red Magnum*; a large, long plum, of an austere taste; is excellent for sweet-meats; and the tree is very fruitful....17. The *Bonum Magnum*, *White Holland*, or *Mogul Plum*, is very plentiful; and, when ripened against the wall, acquires a good taste: it may be easily preserved....18. The *Mirabel*, is a small yellow plum, with a saccharine juice, and in great abundance...19. The *Apricot*; a large, yellow, round, plum, the pulp of which is firm, sweet, and will be much improved by ripening against a wall....20. The *Rochcourbon*, or *Red Diaper*, one of the most excellent varieties of the plum-kind: it is of a large size; a red colour; and has a sweet taste....21. the *Gage*, is reputed to be equal in flavour, beauty, and in other respects, to the best plumbs that are cultivated: it is very productive, whether it be planted against a wall, or in an open exposure....22. The *St. Catharine*, is principally calculated for sweet-meats. It produces abundantly, but requires to be reared against a wall, by which means its fruit is greatly improved, both in size and taste....23. The *Spanish Red Damask*; a round plum of a middle size: it thrives best under the shelter of a wall; has a red tinge, and abounds with rich juice....24. The *Muscle Plum*, is one of the most common kinds; and of an indifferent flavour.....25. The *White Pear Plum* ripens at a late period: it is chiefly cultivated for stocks, on which tender peaches may be *budded*.

[Mr. Robert R. Livingston, says he plants his Green-gage-plums in the richest spots of his garden, the soil of which is a loam upon a light sand, dug up and mixed, and highly manured every year. He scarcely ever fails to ripen as much fruit as the branches can carry without danger of breaking. He had a fine *Draft d'or* plum, planted in a stiff clay, which at the end of fifteen years, was not nine feet high, but on removing it into his garden, it grew more in the course of two years, than in the preceeding fifteen: a full proof of the necessity of a rich soil for this fruit. See *Trans. New-York Agric. Society*.]

All the different varieties of plums have originally been raised from the stones, and afterwards grafted or budded on plum-stocks. The best for this purpose is the Sloe-tree, or Black-thorn; and, as the operation varies but little from that already described under the heads of Engrafting and Inoculation, we refer the reader to those articles.

Beside their utility as a culinary fruit, plums possess valuable me-

dicinal properties. In a dried state, they are called *Prunes*, and are eminently useful in cases of costiveness accompanied by irritation, that would be aggravated by powerful laxatives; but they ought not to be eaten after long fasting, or for supper, unless mixed with other aliment; as they are apt to produce flatulency. With this exception, they suit almost every constitution, and produce both cooling and aperient effects; but, when prunes do not operate sufficiently, their power may be increased by combining them with a small portion of rhubarb, or cream of tartar.

If *plums* be eaten in a fresh state, or before they are perfectly ripe, and in immoderate quantities, they induce colics, looseness, and similar affections in the stomach and intestines. The larger kinds, especially, ought to be used seldom, and with great precaution, being more dangerous than the smaller plums; because the former are rarely permitted to attain to maturity.

PLUME, or PLUMAGE, denotes the feathers of birds, which are frequently worn by military men, and females, as ornaments to the head-dress; a custom orginally derived from barbarous nations.

Although we do not approve of such tinsel decorations in domestic life, yet, as the young and gay, especially in public places of resort, such as balls, masquerades, &c. are frequently liable to tarnish, or otherwise to injure the beauty of their costly feathers, we shall insert the following methods of cleaning them:.....*White plumage* may be effectually bleached by dipping it in the oxygenated muriatic acid, or bleaching liquor of BERTHOLLET; and, if this cannot be easily procured, by simply immersing it for a few hours in pure water acidulated with oil of vitriol, in the proportion of six or eight drops of the latter, to every ounce of the former; then drying the feathers in the sun, or at a distance from a fire.....*Variegated plumage* may be cleaned and restored to its former brightness, by gently wiping it with a soft sponge dipped in spirits of wine; and, after it has been gradually dried, by moistening the downy part with a filtered solution of gum-arabic, or tragacanth;.... then cautiously exposing the tops and sides to the heat of a bright fire, in order to curl their extremities.

POISON, a term denoting any matter that may prove detrimental, and frequently fatal, to the life of animals, whether it be taken in small portions by the mouth, mixed with the blood, or applied to the nerves by friction of the skin, or other means.

Poisons are divided into vegetable, animal, and mineral; but, as we state the particular substances, together with their appropriate remedies, in their alphabetical order; and, having already given the general precautions in case any poison have been swallowed (under the article ANTIDOTES), we shall at present add a few suplementary directions, to be followed in those situations, where poisoning has either actually taken place, or is strongly suspected.

I. In order to ascertain the nature of the deleterious matter, the remainder of the poisoned aliment (if any) should first be examined. The patient, as well as the persons present, ought likewise to be strictly interrogated, and the symptoms accurately investigated.

II. The next measure necessary to be pursued, is to learn the portion of the poison taken into the stomach: whether it was administered by mistake in medicine, food, drink, or in any other form. In this case also, attention must be paid to the symptoms, such as violent looseness, nausea, and vomiting, convulsions, swelling of the face, &c...Lastly, the time elapsed since the swallowing of the poison, and the antidotes given, together with their operation, should be minutely inquired into, as well as the effects resulting from this unfortunate casualty, such as palsy, apoplexy, colic, &c.

Where poison has been recently swallowed, it may be discharged either by means of an emetic, or by tickling the throat with a feather, and administering such a quantity of oil, mixed with milk, as the patient is able to drink. But, if the accident be discovered several hours after it has happened, emetics would be productive of fatal consequences: it will, therefore, be advisable to prevail on the patient to take large draughts of lukewarm water, milk and oil, and to resort to tepid bathing.

POKER, a well known instrument, generally manufactured of iron; and employed for stirring the fire.

As many casualties occur from negligence, or imprudence, in leaving pokers in the fire, we shall state the following expedient, by which they may in future be prevented. It consists simply in welding or soldering a small cross of iron (projecting about an inch and a half each way), immediately above the square part of the poker, called the *bit*. By this contrivance, the instrument cannot be thurst into the fire farther than such bit; a circumstance of some advantage, where fire-irons are highly polished. Besides, if the burning coals should yield, or any other accident happen, so as to cause the poker to slide out, it will probably be arrested on the edge of the fender. And, though it should fall on the hearth or carpet, neither of these will sustain any material injury; as the heated part or *bit*, will be elevated several inches above the floor.

POLE-CAT, or *Mustela putorius*, L. an animal of prey, of a dusky-yellow colour, with whitish ears and muzzle: it inhabits most parts of Europe; and in temperament, manners, disposition, and form, resembles the Martin.

Pole-cats burrow under ground, forming a shallow retreat about two yards in length, which generally terminates under the roots of a large tree. The female breeds in the spring, and brings forth three, four, and sometimes five young at a time.

These predatory animals approach our habitations, mount on the roofs, or take up their abode in hay-lofts, barns, and unfrequented places, whence they issue during the night, in search of prey. They occasion greater havock among poultry, bees, &c. than the Martin: with a view to obtain honey, they attack the hives in winter, and compel the bees to abandon them. When frightened, the pole-cat emits an exceedingly offensive fetor; which is so pungent and hurtful to fowls, that they sometimes fall down from the places where they roost; and thus become a prey to this quadruped.

For a method of exterminating these depredators, we refer to the article MARTIN.

POLL-EVIL, in farriery, is an abscess formed in the sinuses between the poll-bone, and the uppermost vertebræ of the neck of a horse.

When this malady is occasioned by blows, bruises, or any external violence, the swelled part should first be bathed with hot vinegar; but, if the hair be fretted off, and a discharge ooze through the skin, a fomentation, prepared of two parts of vinegar, and one of spirit of wine, will be more proper..... Should, however, great irritation arise from heat and inflammation, it will be necessary to bleed the animal, and to apply poultices of bread, milk and elder-flowers; which method, with the assistance of appropriate physic, will frequently disperse the swelling, and prevent the farther progress of the disease.

But, when the tumour becomes *critical*, and contains fluctuating matter, its maturation ought to be promoted by poultices, till it either burst spontaneously, or arrive at a state proper for applying the knife. If such operation become necessary, it should always be performed by a skilful veterinary surgeon; as it frequently happens, that though a complete cure of this evil be effected by common farriers, yet, by making deep incisions, resorting to corrosive mixtures, and a tedious course of hot, irritating applications, the poor animal is so disfigured as to be fit only for the meanest drudgery.

A more judicious and simple method of discussing tumors of this description, has lately been recommended by Mr. CLARK, of Edinburgh. As soon as matter is perceived to fluctuate in the part affected, Mr. C. directs a large seton-needle, armed with a cord, to be introduced at the upper part of the swelling, and brought out at the under or lower part of it: from which orifice the pus will speedily discharge itself; and in a few weeks the wound will be perfectly healed, without leaving any scar or blemish, or the least trace of the disorder. Deep-seated abscesses may be treated in a similar manner; and if there be two or more sinuses, the same method may be adopted, in order to obtain a depending orifice, for a free discharge of matter: thus, a cure is generally and speedily effected.

POLLEN, or *Farina fecundans*, denotes the fertilizing powder, found in the anthers, or tops of the stamina of plants; and which, when sufficiently mature, is conveyed to the pistils for the purpose of fecundation.

The farina is, in general, of a yellow colour; it is very conspicuous in the tops of young or unripe flowers, and especially in those of lilies and tulips. It consists of minute hard particles, covered with one, two, or three elastic membranes, bursting and shedding the flower dust to a considerable distance, as soon, as it has arrived at maturity. When viewed through the medium of a microscope, they usually present a particular form, that is observable throughout the genera of an order, as well as all the species of a genus of plants.

Naturalists have discovered, that the pollen contains a waxy, unctuous matter, and is collected in the hairs with which the thighs of bees are covered. These insects triturate, and otherwise prepare it in

their stomachs, whence it is ejected in a concrete form, under the name of WAX.

POLISHING, in general, denotes the act of smoothening and imparting brightness to hard substances, such as metals, marble, glass, &c. by rubbing them with certain matters adapted to the purpose.

Having, on many occasions, stated different mineral and vegetable bodies that may be employed with a view of polishing metals (a summary account of which the reader will find in the concluding *General Index of Reference*), we shall at present only remark, that one of the most proper articles, in this respect, is the *Asphodelus luteus*, L. or Common Yellow ASPHODEL, the useful properties of which we have described vol. i.....The stalks of this plant are somewhat thicker than a goose-quill; and when dipped in Colcothar, or *Crocus Martis* (which may be had of the druggists), reduced to a paste with sweet-oil, and properly applied to iron and brass utensils, will not only render them exceedingly bright, but also prove a better preservative from the rust, than sand-paper, or other rough materials.

POLYANTHUS. See PRIMROSE.

POLYPODY, or *Polypodium*, L. a genus of plants comprising 142 species; 18 of which are indigenous, but the following only deserve to be mentioned:

1. The *vulgare*, or COMMON POLYPODY, is perennial; grows on old walls, shady places, and at the roots of trees: it flowers from June till October...The root of this plant has a sweetish taste; but, by long boiling, it becomes bitter. When fresh, it operates as a mild laxative, so that an infusion of six drams of this root, in half a pint of boiling water, may be taken in divided doses.

2. The *Filix-mas*. See FERN the Male.

3. *Oreopteris*, or HEATH POLYPODY. This plant is likewise perennial, and its leaves emit a very agreeable scent.

POMEGRANATE-TREE, or *Punica*, L. an exotic, growing in chalky soils, and consisting of two species:

1. The *granatum*, or Common Pomegranate-tree, which is a native of Italy, and other southern parts of Europe, where it grows to the height of 18 or 20 feet. In Britain, it is cultivated only in the gardens of the curious; as its fruit seldom attains the delicacy of that imported from warmer climates.... Among other experiments made with different parts of this tree, in dyeing, we shall relate only one mentioned by BOHMER. From the deciduous leaves in autumn, when they present a brownish-red shade, he obtained, by boiling them, a thick muddy liquor, in which cotton, silk, and woollen clothes, acquired a good French-blue colour: these materials had been previously immersed in a solution of green vitriol; and, after becoming dry, they were, by different trials, plunged in vinegar, and soap-water, neither of which in the least affected their tint, so that it was doubtful whether they were dark-blue, or black....In Germany, the tanners formerly employed the bark of this tree as a substitute for sumach....See also MOROCCO-LEATHER.

2. The *nana*, or Dwarf American Pomegranate, has a short stem rising only four or five feet high, bearing narrow leaves, and minute red blossoms, which are

succeeded by small fruit....It flowers from June till October.

Both these species may be propagated by layers, that should be selected from young branches, and planted in autumn. They may be trained either as half or full standards, or as dwarfs; but, if the pomegranates are to be raised against walls, it will be advisable to pursue a treatment similar to that directed under the article PEACH-TREE.

The fruit of this shrub is agreeable to the palate; and, in common with other sweet summer fruits, allays heat, mitigates thirst, and is mildly aperient. Its rind is powerfully astringent; on which account it is, together with the bitterish red flowers, occasionally employed in diarrhœas, dysenteries, and other disorders proceeding from debility.

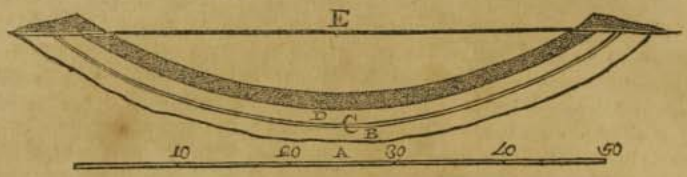
POND, a small pool, or collection of standing water.

Ponds are of great utility in agriculture, and for various other purposes: hence different methods and expedients have been devised, with a view to obtain a constant supply of water: from these we have selected the following, which appear to merit particular attention.

In the first vol. of the *Journal de Physique*, we meet with an interesting *method of making ponds water-tight, without the aid of masonry*, by M. DAMBOURNEY....He directs the pit to be dug to a convenient depth; and its sides to be carefully sloped to an angle of about 40 degrees. The cement with which it is to be lined, should then be prepared in the following manner.

A sufficient quantity of brick-clay ought previously to be procured, in a moist state, so that it may be easily worked and incorporated with one-fourth part of quick-lime, slacked the preceding evening, in such a portion of water, as will reduce it to the consistence of cream-cheese; and the whole must be formed into balls, about two feet in circumference. When an adequate stock is collected, the workman descends into the cavity, and an assistant supplies him with a ball, which the former throws with all his strength on the ground, near the centre of the pit: thus, he continues the plastering with other balls, in such a direction that each may come in contact with the next following, till the sides and bottom of the intended pond are perfectly lined. If the whole cannot be finished in one day, the last row laid on in the evening should be moistened, in order that it may be sufficiently adhesive; to incorporate exactly with the new part of the work on the subsequent morning.....Two or three days after this composition is applied, it should be beaten with a flat piece of wood; and, accordingly as its firmness increases, the beating must be stronger, and the surface occasionally wetted, to prevent cracks, till it become one uniform, solid piece. Lastly, the whole is to be covered with a coat of any cheap oil: and (previously to the admission of water), with gravel, to the thickness of one inch. By this management, the coating will acquire a very remarkable degree of firmness; and, if the pond be constantly full, no repairs will become necessary; as the only injury to be apprehended, may proceed from intense frost, which is apt to damage such parts of the work as are exposed to the air.

In the sixth volume of *Annals of Agriculture*, an account is given of a simple method of making *artificial ponds, in dry soils*:...the subjoined cut represents an outline of their construction.



The line A. describes a circular hole made in the ground, of such size as may be found necessary; and on which a stratum of clay, B. must be carefully beaten, and trodden into a solid, compact body, from four to six inches in thickness.

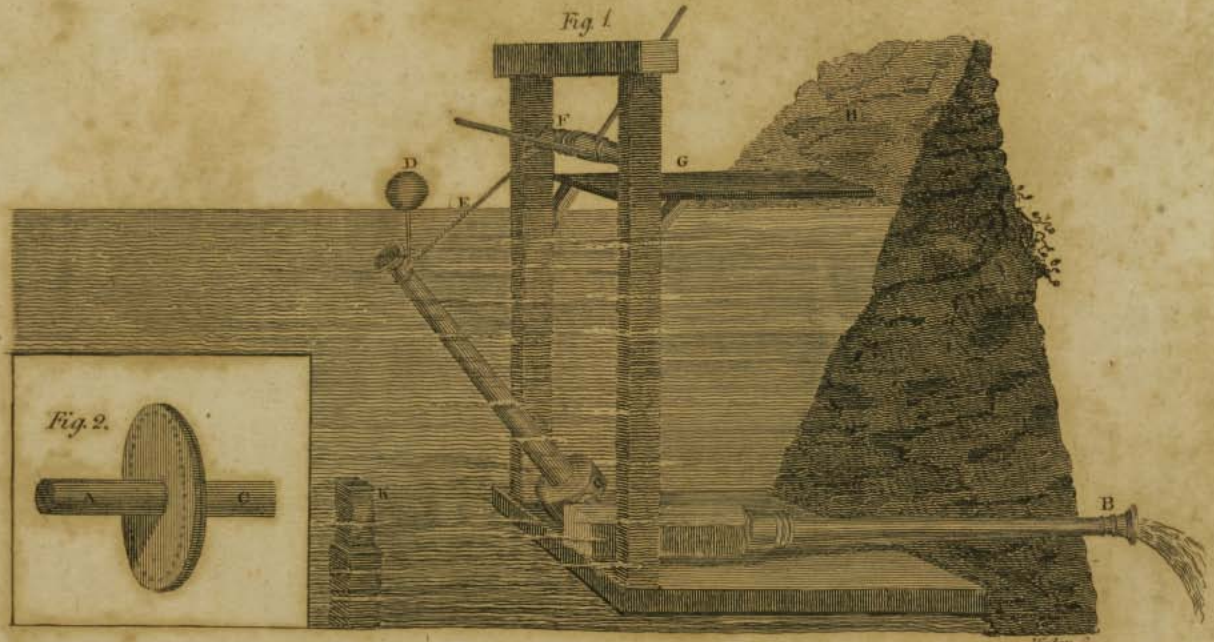
C, represents a layer of quicklime about an inch, or an inch and a half thick; and which should be uniformly spread over the whole.

D, is a second stratum of clay, that ought to be of a thickness similar to that above-mentioned, and should be pressed down in the same manner.

E, denotes stones, or gravel, either of which must be spread on the second layer of clay, to such depth as may prevent the pond from being injured by the feet of cattle; for otherwise, they will penetrate the stratifications of clay and lime; in consequence of which, the water will be discharged through the pores of the earth. When thus completed, according to the section above given, the pond will remain five feet deep, and forty-five in diameter; at which size these reservoirs are in general constructed;.....the letter F, representing the line of level, both of the water and of the ground.

This method of forming ponds was contrived in Yorkshire, about 25 or 30 years ago, by a well-sinker:.....numerous artificial pools have since been made in that, as well as the adjoining counties..... The expences attending a work of the dimensions above stated, are computed to be from 4*l.* to 6*l.* according to the distance from which the clay is carried. Such a pond will remain unimpaired for a series of years; because the lime prevents worms from striking either upwards or downwards, and consequently from injuring the clay, which naturally resists moisture.

Beside the utility of ponds, by affording a constant supply of water for various purposes, the Mud settling at the bottom furnishes an excellent manure. Hence it is a desirable object to draw off the fluid part so as conveniently to arrive at the sediment: for this purpose, a hole or pit should be dug in the center of the pond, as far as the stratum of sand, which usually lies under that of clay. Thus, the water will be immediately absorbed, and the pond completely emp-



Machine for draining Ponds without disturbing the Mud

tied :....the sides of the cavity, however, ought not to be made so steep as to prevent the return of cattle, in case they should enter it by accident.

In the 8th vol. of the *Transactions of the Society for the Encouragement of Arts*, &c. we find a short account of a *Machine for draining Ponds, without disturbing the mud.* It was communicated by Lieutenant-Colonel DANSEY, together with a drawing and model, of which we have given an engraving,

Fig. 1. A, is the pipe, loaded with a rim of lead, of such a weight as serves to sink it beneath the surface of the water.

B, represents the discharging pipe, that is laid through the bank H. I.

C, the joint on which the pipe, A, turns; and the form of which is delineated in Fig. 2.

D, the ball or float, that swims on the surface of the pond, and thus prevents the pipe A from descending to a greater depth than the length of the chain, by which they are connected, will admit.

E, a chain that winds on the windlass F; and serves to raise the tube A, above the surface of the water, when the machinery is not in use.

G, a stage.

H, I, the bank, which is represented as if it were cut through at I, in order to delineate the tube B, lying within it.

K, is a post designed for the reception of the pipe A, when the latter is lowered, and also for preventing it from sinking in the mud.

Fig. 2. A, is a cast cylinder, furnished with a brass plate or cheek, which is fastened to the timber of the tube, on one side only; because the part of the cylinder C, turns in the hollow of the wooden tube, when it is immersed in the water. A piece of strong sole-leather is placed in the inside of such plate, to prevent leaking.

The model represented in our engraving, was constructed from the description of a machine employed by a gentleman residing in the vicinity of Taunton. In the year 1783, Colonel DANSEY's regiment was quartered at Windsor; and, conceiving that the invention might be useful for the supply of the grand cascade at Virginia-Water, he presented the model before-mentioned to His Majesty, who graciously signified his approbation. In consequence of this event, a pen-stock was erected on the same plan, at one of the ponds in the vicinity.

Colonel D. observes, in his communication to the Society, that he has often tried the model in a vessel of water; and, as the principle on which it is constructed, may be farther improved and extended, in the hands of ingenious men, we have furnished our readers with an accurate engraving: this machine is applicable to silk, cotton and other mills; where an uniform and steady velocity of water is required, which may at pleasure be regulated, without occasioning any current to disturb the fish, or mud; because the stream constantly runs from the surface.

POND-WATER, to which cattle generally resort for drink, is a fluid strongly impregnated with saline and oily particles: hence it should never be suffered spontaneously to evaporate during the summer.

For the important purpose of

IRRIGATION (which see), pond-water is in every respect equal to the liquor collected in farm-yards. See also Fluid MANURES in this volume.

POND-WEED, the BROAD-LEAVED, or *Potamogeton natans*, L. an indigenous perennial plant, growing in ponds and slow rivers; flowering in the months of July and August. The leaves of this weed float upon the surface of the water, and thus afford an agreeable shade to fish: its roots are said to be exceedingly grateful to swans.

POOR, an appellation given to persons whose situation is so reduced as to render them chargeable to the parish.

Previously to the Reformation, the poor received alms, and other benefactions, from the monasteries, and religious houses; but, on the suppression of the latter, the wealth with which they were endowed, was diverted into other channels; and the poor, being thus left destitute, became a heavy burthen to the nation at large.

The 43d Eliz. is generally regarded as the basis of the poor-laws in England; and, though it was framed with great judgment and circumspection, yet experience has evinced, that it is not calculated to produce the salutary effects, that were expected to result from these regulations. It would, indeed, be a task equally invidious and foreign to our plan, to point out the defects of any statutes that have been passed for the relief of the poor; yet, as this *national provision* (which prevails in no other country in Europe), has been considered as tending to produce consequences prejudicial to society, we shall briefly state a few of the objections that have been urged against its principle.

First, it is argued, such *compulsory relief* checks the spirit of industry, and frugality; because the apprehension of being in want at some future period, which would otherwise stimulate persons to exert themselves during health and youth, in order to provide against the approach of sickness and old age, must necessarily be weakened, when a prospect of receiving assistance from the parish is held out to the indigent. In consequence of such fallacious hopes, many unprincipled or phlegmatic individuals wilfully neglect to seize opportunities of advancing in life, and obtaining an honest competence against the day of want; so that, on the most trivial occasions, they become chargeable to the parish.

Farther, this *legal* relief is supposed to destroy every emotion of gratitude in those who receive it, and who are consequently led to imagine that they have a *lawful* claim to such assistance. These exactions apparently tend to extinguish *charity*, and to steel the hearts of the humane, even against a truly deserving object. It is true, the covetous are compelled to contribute towards the support of the poor, disabled, aged, and distressed; but the evils arising from such a system, more than counterbalance this advantage, and are eventually oppressive to many industrious families; who can ill afford to pay their quota of the poor-rates.

To remedy these notorious grievances, houses of industry, poor-houses, and work-houses, have been proposed and carried into effect. In some places, they have been attended with the most bene-

ficial consequences ; while, in others, the rates have continued to increase in a most alarming degree. This growing evil has been attributed (and we fear, in many cases, with too much justice), to the almost unbounded and resistless power, exercised by overseers in their respective parishes; who are, for the greater part, illiterate landholders, that are put into office, according to the routine of business, on account of their large farms, or other occupations. One of the most rational expedients that can be suggested, with a view to check such inconveniencies, is the incorporation of the hundreds; and the appointment of men of *liberal education* to the superintendance of all affairs that respect the poor. Influenced by no selfish or pecuniary motives, they would conduct every part of their duty in the most economical manner; and the necessary consequence would be the reduction of the poor rates : indeed, experience has proved, in parishes, where the attention of liberal-minded men to parochial business was obtained, that a saving of *several hundred pounds* per ann. resulted to the benefit both of the poor, and of the house-keeper ; but, as soon as *gentlemen* resigned their office, the old abuses were renewed, and the rates were annually augmented in arithmetical progression.

See some valuable remarks in Mr. SAUNDERS's *Observations on the present State, and Influence of the Poor-Laws*, &c. (8vo. p. 190, 3*s*. 6*d*. Sewell, 1800); in Mr. BLEAMIRE's *Remarks on the Poor-Laws, and the Maintenance of the Poor* (8vo. p. 36, 1*s*. 6*d*. Butterworth, 1800); and lastly, in the *Reports of the Society for bettering the Condition, and increasing the Comforts of the Poor ;* a work that is periodically continued under the patronage of that benevolent association.

POOR-MAN'S PEPPER. See PEPPERWORT.

[POLYGALA, a genus of plants, comprehending four species; three of which, according to the Rev. Dr. MUHLENBERG, grow in Pennsylvania, viz. the *senega*, *sanguinea*, and *verticillata*. The first species only, shall be here noticed; as the virtues of the others, have not been ascertained.

The *Polygala Senega*, abounds in nearly all of the United States, and was first introduced into use, in 1739, by Dr. TENNENT of Virginia, who wrote a pamphlet on the subject, and highly extolled it, as a remedy for many complaints, and particularly as a specific for the cure of the bite of our rattle snake. Hence it has been called rattle snake root, but more commonly *senaka snake root*, since it has been repeatedly found to fail either in preventing or curing the effects of the bite.

In small doses, it stimulates the throat and faces to a considerable secretion of saliva and mucus; in large doses it nauseates, powerfully promotes perspiration, and purges.

This remedy has been found useful in the following complaints.

1. In the *Cynanche Trachealis*, *hives* or *croup*. See vol. 2. p. 285.

2. In the *Scarlatina Anginosa*, or scarlet fever and sore throat, according to Dr. WITHERING, it produced good effects as a diuretic.

3. In *Dropsy*, Dr. MILLMAN and Dr. PERCIVAL used it with advantage in this complaint, pre-

pared agreeably to the Edinburgh dispensatory; in the Pennsylvania hospital, it has been also used with success, and appeared to *excite the powers of mercury*, which had been previously given. Where an increased circulation is present in dropsy, which frequently happens, moderate bleeding must be premised.

4. In *Tetanus*, or lock-jaw causing a copious sweat, Massie's *Inaugural Dissertation*, Philadelphia, 1803.

5. In the decline of pleurisies and catarrhs, to promote expectoration. In suppressed coughs of aged persons, and in asthma it doubtless is useful; a gentle constant stimulus on the throat should be kept up, in these diseases.

6. In female obstructions, it is a powerful remedy, as appears from Dr. Massie; the preferable mode of exhibition is in decoction or tincture.

1. *For Decoction*.....Root ½oz. water half a pint, boil to a gill, dose one tea spoonful.

2. *For Tincture*....Root ½oz. spirit half a pint, digest for ten days, and strain....dose twenty to thirty drops, two or three times a day.

POLYGONUM, *Persicaria*. A native and common plant of the United States. Dr. Danar of Jamaica, relates (*medical assistant*) on the authority of Mr. Felsted of Jamaica, that an infusion of the dried plant, or a decoction of the fresh plant, is a powerful promoter of urine, and very useful in the gravel.]

POPLAR, or *Populus*, L. a genus of trees comprising 13 species, of which the following are the principal, and the three first are natives of Britain:

1. The *alba*, White Poplar, or Abele-Tree, grows in hedges and brooks, where it flowers in the month of March. It delights in gravelly soils and lofty situations, though it also thrives in clay-lands. This tree is remarkable for its speedy growth; as it attains its full size in 20 years; being, however, subject to excrescences resembling warts, that sometimes become exceedingly large; and, as they absorb humidity, occasion the tree to decay.... Its wood is white, soft, though tough, and neither exposed to the ravages of worms, nor subject to warp or shrink: hence it is advantageously employed for wainscotting and floors; as well as for packing-boxes, laths and turnery-wares. The bark of the white poplar, according to the Rev. Mr. Stone (*Phil. Transac.* vol. 53), is eminently serviceable in curing agues. He gathered it in the summer, while abounding with sap; and, after drying it in a gentle heat he administered one dram, in powder, every fourth hour, between the paroxysms. In some instances, he was induced to combine it with the Peruvian bark; but, in general, the former alone proved singularly efficacious. The dried leaves in the winter afford excellent provender for sheep.

2. The *tremula*, Trembling Poplar, Asp, or Aspen-tree, flourishes best in moist woods and boggy grounds, though it will thrive in all other soils, excepting clays: it is in flower during the months of March and April. This species impoverishes the land: its leaves destroy the grass, and the numerous shoots that spring from the roots, spread so near to the surface of the ground, as to pre-

vent the vegetation of every other plant. The leaves are eaten by sheep and goats, but refused by horses and hogs:....the bark, when young, is made into torches. The wood is extremely light, smooth, white, soft, and durable in the air; and though inferior in point of excellence to that of the preceding species, it is usefully employed for pannels, or pack-saddles, milk-pails, clogs, pattens, &c.....From the straight stems of this tree, the most durable shingles are obtained; and Du Roy observes, that bricks burnt with such wood, in a *green* state, acquire a blueish glazing, and additional firmness. Nor is it less excellent for water-pipes; for which purpose it should be felled from April to June, immediately bored, and laid under-ground. It is, however, remarkable, that the wood of the trembling poplar is very liable to be infested with bugs; and consequently improper for bedsteads.

3. The *nigra*, or Black Poplar, grows very rapidly near rivers, and in shady, moist situations, it flowers in the month of March. The wood of this species is soft, light, and not apt to splinter. Its bark is uncommonly light, resembling cork, and is therefore employed by fishermen to support their nets: the inner-rind is used by the inhabitants of Kamschatka as an ingredient in their bread.... The buds, which appear early in the spring, contain an unctuous, yellow, fragrant juice, which is the basis of Bee-glue (*Propolis*), and is employed only in ointments for plasters; though its medicinal properties recommend it for internal use:....if formed into a tincture, by means of rectified spirit, and then inspissated, the buds yield an odorous resin, that is reputed to be equal to many of the expensive resinous drugs imported from foreign countries.....The leaves afford a good winter fodder for cattle, and should be collected in October, before the branches are cut for faggots....Lastly, the roots of the black poplar dissolve into a kind of jelly. The wood is useful for the engraver; and, when sawed into boards, and sap-dried, is uncommonly durable....Dioscorides asserts, that the bark of this tree, when chopped small, sown in richly-manured ground, and well watered, will produce an abundant crop of eatable mushrooms: yeast diluted with warm water, and poured on a stump of the black poplar, will be attended with a similar effect; but these fungous plants ought to be gathered after the first autumnal rains.

4. The *fastigata*, Po-Poplar, Italian, or Lombardy-Poplar, is a native of the northern parts of Italy: it also flourishes in moist situations; but will not succeed if its roots are too long covered with water....On account of its rapid growth, this species is greatly esteemed for ornamental plantations: its cuttings are useful for hop-poles: the wood being soft, free from knots, and easily worked, it is much employed by joiners, carpenters, and cartwrights; it may be wrought into very flexible shafts for carriages, or fellies for wheels. Farther, it forms excellent masts of small vessels, and is particularly serviceable for packing-boxes; because the plank, yielding to the nail, is not liable to be split; and, in case the box, &c. be accidentally dropped on the ground, the boards are not so easily broken or splintered, as those of oak and

other trees. Lastly, it appears from numerous experiments made by DAMBOURNEY, that the Italian Poplar affords a dye of as delicate a lustre, and equally durable, as the finest yellow wood: its tinging matter is more readily extracted; but, instead of striking a proper green with indigo, it changes to an olive shade. The dry branches are preferable to those in a green state; nor should they be cut or bruised; being possessed of the property of fixing the colours obtained from Brazil and logwood.

5. The *balsamifera*, is a native of Carolina, where it attains a considerable size. It is best adapted to boggy soils; and, as it grows with greater rapidity than any of the other species, it soon repays the expence of planting. Its wood is very soft, spongy, light, and principally employed for packing-boxes, though it also furnishes good posts for fences....DAMBOURNEY obtained from the Carolina, as well as the other poplars, a fine fawn, nut, and similar grave colours for wool, according to the quantity of wood employed, and the length of time it was boiled. ....The balsamic juice, expressed from the flower-buds, is probably the American *Tacamahaca*, an excellent application to recent wounds, provided no nerves or sinews have been injured.

[The native species of poplar in the United States are, 1. The *P. Tremula*; 2. *P. Negra*; 3. *P. Balsamifera*; 4. *P. Deltoide*, of Bartram, White Poplar, or Cotton-tree of Carolina, the bark of which resembles that of the Aspen-tree; with large leaves nearly triangular, toothed or indented with deep serratures. The timber is white, firm, and elastic, principally in use for rails. 5. *P. Heterophylla*, Virginia Poplar-tree.]

All the Poplars may be propagated either by layers, cuttings, or suckers, which should be planted in a nursery for two or three years previously to their removal. The most proper time for transplanting suckers is in October, when their leaves begin to decay; but, if the trees are to be reared from cuttings or layers, it will be advisable to set them in February, when they ought to be put about a foot and a half deep in the ground, and closely rammed in. These will speedily take root; and, if the soil be moist, will in a few years attain considerable size.

To conclude this article, we shall briefly state an important fact which deserves the attention of those who are in possession of numerous *poplars*. The different species of these trees produce, on the upper part of their seed-vessels, a woolly or downy substance, which is of considerable value: by combining it with cotton, Prof. HERZER, of Munich, has lately converted this composition into wadding, counterpanes, gloves, stockings, &c.....From a mixture of two ounces of the down before mentioned, and four ounces of hare's wool, he obtained excellent hats; and, according to his calculation, each poplar-tree yields not less than 40lb. of such material.

POPPY, or *Papaver*, L. a genus of plants comprising nine species, eight of which are indigenous; the following, of these, are the most remarkable:

1. The *Rhœas*, RED POPPY, CORN-ROSE, COP-ROSE, or HEADWARK, grows in corn-fields, and flowers from June till August. The petals, when infused, yield a fine

colour; and a syrup is prepared from such infusion, which partakes in some measure of the properties of opium, and is occasionally used in coughs, and catarrhal affections, on account of its anodyne effects....These flower-leaves also yield, on expression, a bright-red juice, which imparts its colour to water, and the tint of which may be greatly improved by the addition of the vitriolic acid. Thus cloth, linen, and especially silk and cotton, were dyed of a beautiful deep-red shade.....The stuffs, previously immersed in a solution of bismuth, acquired a yellow cast; though DAMBOURNEY obtained only a pale nut-colour.

2. The *album*, *v. somniferum*, WHITE or WILD POPPY, is found in neglected gardens and cornfields, where it flowers in the month of June or July. The juice, which, after making incisions, exudes from the heads of this species, is suffered to inspissate by the heat of the sun, and thus affords the drug called OPIUM. An extract is also prepared from these seed-vessels; which, being less powerful than the foreign opium, is given in a double quantity, to produce similar effects. The seeds are very nourishing; are divested of the narcotic property of the flower; and yield on expression, a mild, sweet oil, little inferior to that of almonds: hence, they are often employed as an article of diet....LINNÆUS counted in one poppy-head 32,000 seeds; and as there are *white* and *blue* grains, we understand from an experienced gardener, that the former, when found in heads, the capsule of which is of a blueish cast, are the most successful for propagating the species, and likewise afford a larger proportion of sweet-oil than the blue seed.

Poppies grow in almost every soil, but they flourish most luxuriantly in rich loamy ground, well manured with rotten dung, and frequently ploughed or turned, so as to render it mellow. The seeds may then be either drilled in rows about nine inches apart, or sown broad-cast, first towards the end of February, and a second time in March; though the latter process is sometimes followed, for winter-seed, in the month of September or October. As soon as the plants appear, they must be carefully weeded, by which means their growth will be promoted; so that each root will produce from four to ten heads, or pods, containing large variegated flowers. When the leaves begin to wither, it will be proper to extract the opium: for this purpose, four or five longitudinal incisions, about one inch in length, must be made on one side of the head, so as to cut through the outer or scarf-skin, without injuring the seeds. In consequence of such wound, a glutinous milky fluid will exude, which should not be removed till the succeeding day, when it ought to be scraped off into proper vessels; and, in the course of one or two days, the opium will be of a proper consistence to be formed into a mass. The opposite side must next be wounded in a similar manner, in order that the viscous juice may be completely extracted.

In the year 1796, the *Society for the Encouragement of Arts*, &c. granted the premium of 50 guineas to Mr. BALL; and also a similar reward to Mr. JONES; for their exertions in obtaining the largest

quantity of *British Opium*. As their method was nearly similar to that above described, it is but justice to observe, that their preparations have received the sanction of several medical gentlemen, in whose opinion, the new produce is in all respects equal to the best Turkey opium. [Opium has also been raised in the state of New-York, in the year 1787, by Dr. S. RICKETSON, and found to be fully equal to, nay stronger than the foreign drug. See the *Medical Repository*, vol. i. p. 420, and vol. iii. p. 206.]

3. The *Argemone*, PRICKLY, or LONG ROUGH-HEADED POPPY, is an annual plant. It is distinguished from the genuine, by its prickly seed-capsule, and the black points of its red flower-leaves.

PORCELAIN, or CHINA-WARE, a most refined, and almost vitrefied, species of earthen-ware, which is not only manufactured in China, but likewise in England, France, Holland, and Germany: the most esteemed and beautiful, both for its painting, and the taste displayed in shape and figure, is that imported from Meissen, in Upper Saxony.

As a detail of the manner in which porcelain is manufactured, would be foreign to our plan, we shall concisely relate the simple, but valuable method of converting common green glass into porcelain, discovered by M. REAUMUR. It consists in exposing such glass, surrounded with white sand, plaster of Paris, chalk, or gypsum, in a luted crucible, to a degree of heat equal to that of potters' furnaces, so as not to alter its form or shape. At first, it will assume various shades of blue; become gradually white; and, at length, no appearance of glass will remain. By this process, entire green bottles and other vessels may be converted into the finest china-ware.

Porcelain, if not properly annealed, is extremely brittle, and liable to crack: to prevent such accidents, it ought to be well boiled in pure water, before it is used; and, when cold no hot fluid should be put into it, unless there be some sugar, or a tea-spoon in the vessel. Another method of obviating casualties, is that of holding china-vessels over steam, immediately before tea or coffee is poured into them. Such accidents, however, often deface the beauty, or otherwise diminish the value of a *set of china*: hence, it becomes a desirable object to join or cement the fragments, so as to be imperceptible to the naked eye. Under the article CEMENT, and likewise on other occasions (for which the reader is referred to the *General Index of Reference*), we have stated the most proper expedients for this purpose.

PORK, is the flesh of hogs, killed for culinary purposes.

Having already, in the article HOG, treated of the relative salubrity of this aliment, when eaten in a fresh state; and likewise stated the best mode of preserving meat in general, under the heads of BEEF, FLESH-MEAT, and PICKLE; we shall at present only add the method formerly practised for *buccanning*, or pickling pork, by the famous Buccanneers of America. First, they cut the flesh into long pieces, about an inch and a half thick; and, after sprinkling it with salt, and suffering it to remain in that state for 24 hours, these slices were next dried in stoves till they acquired a bony hardness, and a deep brown colour....Pork,

treated in this manner, if packed in casks, may be preserved for upwards of a whole year; and, when soaked in luke-warm water, becomes plump, and has a rosy appearance. It likewise possesses a grateful flavour under the various forms of cookery, and is relished by the most delicate palate.

Beside the usual manner of curing pork with bay-salt, some housewives add juniper-berries, pepper, NITRE, and other antiseptic substances. The salt last mentioned, when used in small proportions, is peculiarly calculated to resist putrefaction.....See PICKLE.

PORTER, a well-known malt-liquor, which differs from ale and beer, in consequence of its being brewed with malt that has been highly dried.

As porter constitutes the principal beverage of all ranks of people in this metropolis, particularly of the labouring classes: and as it is too frequently adulterated with deleterious drugs, and has lately been advanced in price; we think it useful to communicate the following recipe of the ingredients (extracted from Mr. CHILD'S late Treatise, entitled *Every Man his own Brewer*): according to which, every industrious family, where room and other conveniences favour the attempt, may prepare their own porter at a more reasonable rate than it is *now* sold, and without apprehending any adulteration.

One peck of malt
A quarter of a pound of liquorice-root
Spanish juice
Essentia bina
Colour
Half a pound of treacle
A quarter of a pound of hops
Capsicum and ginger
The expence of fuel

These articles, when managed conformably to the directions given in the article BREWING, will produce *six gallons of good Porter*, which, at 1s. 6d. per gallon, would cost 9s. [sterling]; so that one half of the expence is saved by making it at home.

The advantages then arising are obvious; for, independently of its being a great object of economy, a more palatable liquor will result from the undertaking; and, being prepared in the house, it will afford additional pleasure, nay, often contribute to the prevention of a most detestable habit, that of *tippling in ale-houses*.....The proportions above stated are calculated only for small families, or such as cannot conveniently spare a room, or procure a proper apparatus for brewing: hence, by augmenting the ingredients, as circumstances may require, any quantity of pure and wholesome beer will be obtained.

For the information of those, who may be totally unacquainted with the process of brewing porter, we shall add a short explanation of the manner in which the *essentia bina* and the *colour* are prepared. In order to procure the first of these ingredients, a quarter of a pound of moist sugar should be boiled in an *iron* vessel, till it attain to the consistence of a thick, black syrup, which is remarkably bitter.....The colour is produced by boiling a similar quantity of moist sugar, till it acquire a taste between sweet and bitter: it imparts the fine mellow tint, that is so much admired in good porter. In preparing these two ingredients, however, it will be

necessary to employ a small portion of pure, or of lime-water, "to bring it to a proper temper;" because they will otherwise grow hard and dry, if suffered to stand till they become cold. The essence and colour, are added to the first wort, with which they are boiled, and constitute the basis of porter.

This preparation forms an agreeable and salutary beverage to most constitutions; and, if it be *mild*, possessesgently laxative properties: ....when *bottled*, and kept for some time, it acquires a high flavour, and is much esteemed, especially, after having made a sea-voyage. A similar effect will result from sending such liquor to a considerable distance by land-carriage. The bottles ought to be carefully washed, and drained, till they become perfectly dry. After being filled with the liquor, they are suffered to stand for 24 hours, before they are corked, so that the porter may part with some portion of its fixed air, to prevent the bottles from cracking. At the end of that time, they should be closed with *sound* corks, which ought to be driven in, as closely as possible, and to a depth from 1½ to 2 inches, in order to exclude the air.

In regard to the relative salubrity of *Porter*, and other Malt-liquors, we have already expressed our opinion, in vol. i. a.t. BEER.

POST, a stake, or piece of timber, which is fixed in the ground.

Posts are used both for the purposes of building, and of fencing; but, as the strength of the fabric, or of the fence, depends greatly on their nature or solidity, various expedients have been adopted, with a view *to season*, or prevent them from rotting. Among these, burning of the lower or subterraneous part, has been recommended as an excellent preservative; besmearing them with tar, pitch, &c. has likewise been found very serviceable; but the most effectual method is that employed in the county of Durham. It consists in indenting, or puncturing the stake at right angles, to the heart or pith, by means of an instrument, somewhat resembling the *caulking-irons* of ship-carpenters; and which is furnished with one, two, or three rows of teeth. The wood ought previously to be well seasoned, warmed, and, lastly, coated with pitch or coal-tar; which will penetrate as far as its centre. By this operation, the strength and durability of timber will by no means be diminished; on the contrary, it will thus be better enabled to withstand the injuries of the weather.

POT-ASH, denotes an alkaline salt, or, with more propriety, a compound of different salts, obtained by reducing large quantities of wood to ashes: this process is termed, by chemists, *incineration*. The ashes are next boiled in water, so as to form a strong ley, which, after being strained, is evaporated in an iron vessel almost to dryness; the matter, which remains at the bottom, is then put into a crucible, liquefied over an intense heat, and poured out on iron plates, where it speedily cools, and assumes the form of solid pot-ash.

Such is the method generally practised in making this alkaline salt; but ingenious chemists have contrived various modes of preparing it, with a view to prevent the exportation of the large sums annually paid to Russia, America, Sweden, and other northern countries. Hence, we shall state only

the method followed by Dr. PERCIVAL, for procuring pot-ash from the putrid water which runs from dung-hills; as being entitled to particular attention. His process is very simple: it consists in evaporating the fluid part, and in calcining the impure salt, till the foul or extraneous ingredients are almost entirely dissipated by the fire. From 24 wine-pipes of such liquor, Dr. P. obtained nine cwt. and 40lbs. of saleable pot-ash, which was valued at 2lb. 2s. per cwt.; the expence of the whole process amounted to 4l. 9s. The salt, thus procured, has a greyish-white appearance; and is, when broken, of a hard, spongy texture: it is slightly affected by moist air; but, if it be kept in a dry apartment, near the fire, a powder is formed on its surface. Lastly, this species of pot-ash contains, according to Dr. P.'s chemical analysis, such a proportion of pure alkali, as amounts to one-third part of its weight; while that imported from Russia, yields only one-eighth.

In the year 1796, a patent was granted to Mr. HOAKESLEY, for his method of making British pot-ash; for the supply of all manufactures, in which the foreign salt or any alkaline matter is useful. The ingredients employed, consist of English, Welch, Irish, or Scotch kelp; foreign barilla; and the salts obtained from soap-boilers' waste, whether by evaporation, or by calcination. The materials are pulverized, and thrown into a furnace of a peculiar construction, where they are, by intense heat, melted into a liquid, which is discharged through a channel into pots..... When cold, the mass assumes the appearance of foreign pot-ash.

Barilla is said to furnish the best *pot-ash*, which is imported from Spain. It may also be advantageously prepared from kelp, salt, or glass-wort, fern, sea-wrack, and a variety of plants that are found both on the sea-coast, and in the interior parts of Britain. This alkaline salt is employed in various manufactures, particularly in those of glass and soap; likewise by dyers, in the scouring of cloths, &c.

[Pot-ash differs very much both in colour, and consistence, and is often blended with various substances by the manufacturer. The different proportions of the constituent materials of the alkali itself, and their different degrees of attractive force, constitute many modifications of the salt, independently of actual impurity.

On the authority of an experienced manufacturer, the editor is enabled to state, that *honey-comb* pot-ash is not good. It is also said, that when it has an acid flavour, and imparts a sourness to the organs of taste, the quality is faulty.

Great care is necessary in attending the fire: which should be brisk and steady, but *not violent nor too long continued.*

"As it is of importance sometimes to know what proportion of real alkali a given weight of pot-ash or pearl-ash contains, it may be proper to point out how this information may be acquired. The strength of the alkali is in proportion to the quantity of an acid required to saturate it. Thus if an ounce of one kind of pot-ash requires, for saturation, a given quantity of sulphuric acid; and an ounce, of another kind requires twice that quantity, the latter is twice as strong as the former. In order however to obtain a sufficiently accurate standard of comparison, it

will be necessary to employ, constantly, an acid of the same strength. This may be effected, though not with absolute uniformity, yet sufficient, for ordinary purposes, by diluting the common oil of vitriol of commerce, to the same degree. For example, let the standard of acid consist of one part of sulphuric acid, and five of water. The strength of an alkali will be learned, by observing what quantity of this acid a given quantity of alkali requires for saturation. For this purpose put half an oz. of the alkali, or any other definite weight, into a jar with a few ounces of water, and filtre the solution; weigh the dilute acid employed, before adding it to the alkali; then pour it in gradually; till the effervescence ceases, and till the colour of litmus paper which has been reddened with vinegar, ceases to be restored to blue. When this happens, the point of saturation will be attained. Weigh the bottle to ascertain how much acid has been added; and the loss of weight will indicate the strength of the alkali." HENRY'S *Epitome of Chemistry*.

Pot-ash is of extensive use in medicine, and particularly serviceable in complaints of the stomach and intestines, attended or produced by acids. Its acrimony must be sheathed however, by being united with some mucilage.]

POT-ASH-CAKE, a kind of biscuit, much used in the state of New-York; and which is baked in the following manner: Take two pounds of wheaten flour, and half a pound of butter: to these must be added half a pound of sugar, that has previously been combined with a pint of milk; and a large tea-spoonful of salt of tartar, crystals of soda, or any other pure pot-ash, which has likewise been dissolved in a small quantity of water. The whole is to be carefully mixed, and kneaded together: when properly rolled, it may be formed into cakes, which ought to be exposed to a brisk heat of an oven; as their lightness depends much on the expedition with which they are baked.

Pot-ash-cake is equally nutritious and wholesome: being speedily prepared, it deserves to be adopted, especially where yeast cannot be easily procured.

POTATOE, the COMMON, or *Solanum Tuberosum*, L. a valuable root, originally a native of America, whence it was introduced into Ireland; and subsequently into Britain, about the commencement of the 17th century.

There are numerous varieties of the potatoe, which are cultivated both for culinary purposes, and for the feeding of cattle. The most remarkable of these are: the Common Kidney; the Red American Kidney; the Aylesbury White; and the Altringham Early White; which are chiefly reared for the table; as the Ox-noble (for the most part in Nottinghamshire); Surinam; Irish Purple; Howard or Clustered; and Red Potatoes, are for fodder.

The common mode of planting potatoes is, by setting the small roots entire; or, by cutting the larger ones to pieces, and reserving one eye or bud to each: it appears, however, that the *rind* may be employed with equal advantage; as crops have thus been produced, which fully equalled those obtained from seeds, sets, shoots, or by any other method.

These plants will flourish in any tolerable soil; but they thrive most

luxuriantly in light sandy loams, that are neither too moist nor too dry. Such lands ought to be deeply ploughed, two or three times; and, shortly before the ground is stirred for the last time in the spring, it will be necessary to spread a considerable quantity of rotten dung on the surface, which should be ploughed early in March, provided the weather be open; but, if it be frosty, this operation must be delayed till the end of that month, or the beginning of April. After the last ploughing, the ground ought to be levelled; the furrows drawn at the distance of three feet apart; and at the depth of about seven or eight inches. In the centre of this furrow are to be set the rind, eyes, cutting, &c.; and then covered in with the earth. A short time before the young plants appear, it will be advisable to pass a harrow over the whole, in order to eradicate weeds, to break the clods, and to remove every obstacle to their vegetation.

Farther, as the potatoes increase, it will be proper to *mould*, or earth them up twice; a process, by which their growth will be greatly promoted.

[Experiments have been made in Lancashire (where potatoes equal to any in the world are raised,) to ascertain the best mode of cutting the sets. A whole potatoe does not always succeed; but a large cutting has been found better than a small one; and that it is best to cut off the sprout or nose end, and also the umbilical or tail end of the potatoe, rejecting both, and taking the middle entire, for the set..... The worst method is cutting the potatoe down to the middle.

The following communication on the subject of the culture of this root is taken from the *Transactions of the Massachusetts Agricultural Society*.

'Letter from JOSEPH BARRELL esq. to the corresponding secretary of the Massachusetts Agricultural Society.

'*Pleasant-Hill, Jan.* 1, 1803.

'In the spring of the last year, I found in the ground a large Irish apple potatoe which had lain there all the winter. This potatoe contained twelve eyes, which I carefully separated and planted in four hills in my garden, three eyes in each hill. I dunged the hill well with horse dung that had rotted in the hot bed the last season; from these four hills I gathered two hundred and thirty-two potatoes; two hundred and ten of them were fit for the pot, and one hundred of the largest weighed thirty-four pounds ....the core of this potatoe, without either skin or eye I cut into six pieces, and planted in one hill: from this I gathered twenty two potatoes, all very small, none bigger than a large cranberry; so that the whole produce was two hundred and fifty-four. It is remarkable, all the potatoes that were from the core, were of the true Irish apple kind, and all that were from the eyes, were of a kind very much like the English whites.

'It should be remarked, that the Irish apple potatoe is not a great bearer, and that the past season was not favorable to potatoes.

'*Mem.* The whole produce of this potatoe, I have preserved, and mean, the next season, to give it a fair trial, and notice the produce of the whole.

'I have, for several years, made experiments on potatoes (some of

which I communicated to the society) and from them I am fully convinced, that small potatoes are as good for seed as large, that three in a hill are better than a larger quantity, that cut potatoes are better than whole, and that eyes are best of all.

'The past season I planted my potatoe fields chiefly with eyes, and had, in some parts a prodigious increase; and in the field throughout, full as large a crop as any of my neighbors, although they planted from eight to ten bushels on an acre; and I planted a short half bushel on an acre, and if I had cut the eyes carefully, I am sure there would not have been a peck to an acre. In this method there will be an immense saving of more than nineteen twentieths of the seed, which is well worth the attention of every farmer who dares to differ from the practice of his father. My overseer, wanting faith in this method, planted a single large potatoe with many eyes in a hill, and it produced only thirty four potatoes of all sizes.

'I am, &c.

'JOSEPH BARRELL."

The following remarks appeared in a daily print on the above.

From the Palladium.

Messrs. Editors,

'Sometime since I saw in your papera letter of JOSEPH BARRELL, esquire, respecting the culture of potatoes, which reminded me of an experiment of a similar nature I made several years ago at the eastward. I carried from Boston a quantity of potatoes for planting, fearing I could not procure them there at that season, which was May, which proved to be the case on my arrival. The people in the township where I took up my residence being mostly poor, and anxious to have some of my seed potatoes, prevailed on me to cut what I planted, and let them have a part to plant in the same way, which I did, and it took only a quarter of the potatoes to plant the piece of land which I intended my whole stock of seed for. However, to be certain whether cut or whole seed would be most productive, I planted in the same field of rich new ground, one very large potatoe whole, and gave it a double portion of *manure. (I felt partial to whole seed.) My potatoe flourished above all the rest of the field, but to my astonishment at harvest, it produced only about two quarts, and not a potatoe a quarter so large as the original; while some of the neighbouring hills yielded a peck and few of them less than a hen's egg. This proved the cutting was best, and I practised it ever after.

A Friend to Agriculture."]

Besides the depredations of worms, grubs, and various other insects, to which potatoes are subject in common with other vegetables, there is a disease termed the *curl*, that peculiarly affects these roots; and for which ingenious agriculturists have endeavoured to account by various conjectures....By some it is considered as a species of blight, but it is more generally attributed to one or more of the following causes: ....1. Frost, either before, or after the sets, &c. have been planted. 2. The planting of such sets, from

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**My manure was green rock weed.*

large or unripe potatoes. 3. From not placing them at a sufficient depth, or from putting them in exhausted lands. 4. By the first shoots of the sets having been broken off previously to planting; in consequence of which, the seminal plant is incapacitated from sending forth other shoots sufficiently vigorous to expand. 5. To a white grub, that preys upon the roots. 6. To the propagation of shoots, sets, eyes, &c. constantly from the same variety, and on the same land, so that the potatoes degenerate, and at length yield indifferent crops.

In the 8th volume of the *Transactions of the Society for the encouragement of Arts*, &c. we meet with an interesting communication on the *curl*, by Mr. W. Hollins, who divides the disease into three different stages, viz.

1. The *Half Curl*, in which the leaves of the plants are somewhat long, and slightly curled: they produce however, tolerable crops, if the summer be not too dry; otherwise the potatoes will be small and watery.

2. The *Full curl:* in this stage the plants seldom exceed the height of six or seven inches; speedily attain to maturity, and decay. The potatoes are, in general, less than a nutmeg; of a dusky-red colour; and are extremely unwholesome as an article of food.

3. *Corrupted Potatoes*, the vegetative power of which is almost destroyed, never appear above the surface of the ground. The seed will be found at Michaelmas in a state, apparently as fresh as when it was first set; a few small potatoes, perhaps, growing from the parent root.

This accurate observer attributes the curl first, to late setting in rich soil, succeeded by a hot, dry summer; in consequence of which, the flower of the plant falls off; the seed is exhausted in feeding the plant; and few potatoes appear. Should moist weather occur in autumn, the plants, after being earthed, will blow a second time, and a plentiful crop of potatoes will be produced. These are, in his opinion, perfectly wholesome as food; but, being generated from the stalk of the plant after the seed has been exhausted, their vegetative power is defective, and the plants that proceed from them will necessarily be *curled*.

The second cause of this disease, Mr. Hollins attributes to the forcing of potatoes, by setting them in too rich a soil. His preventive method consists in *planting them early*, in ridges about one yard apart, having previously spread a little manure in the trench...They are to be set in a triangular form, five or six inches distant, and covered with soil to an equal depth: thus they will be protected from the heat of the sun, in case the weather be too dry, while they remain sufficiently apart for receiving the full benefit of the air. When the plants have attained the height of six or seven inches, he directs them *not to be earthed up*, but to be occasionally weeded....By this simple method, roots will be formed in due season, and grow gradually; and, as the stalk will decay at the proper time, the sap will be left in the potatoe, and *become a seed*, possessing a perfect power of vegetation; so that the plants raised from it will be wholly exempt from the *curl*.

[From the authorities collected by the *British Board of Agriculture*, on the subject of potatoes, it appears, that the curl is very apt to appear in potatoes, planted in ground which has been manured with *lime*, *wood-ashes*, or *coal ashes*; and that it *never* appears in those raised in *mossy land*. The Lancashire planters even send their favourite potatoes to the mossy grounds to recover, after they have caught the distemper. This is an invaluable fact, for the owners of mossy land, of which the farmers near Elizabethtown, and New-Brunswick, New-Jersey, should profit.]

There prevails another opinion respecting this disease, namely, that it is *contagious*; but such notion has been ably combated in the 2d vol. of *Communications to the Board of Agriculture*; where it is observed, that whatever tends to render a crop poor and weakly, is very apt to produce the curl: hence, the disease probably originates entirely, or in a great measure, from the following causes: 1. Land, altogether unfit for potatoes. 2. Imperfect culture. 3. Small roots; or too small a proportion of strong roots. 4. Sets, taken from roots that have sprouted early, and the germs of which have been rubbed off. 5. Too small, as well as too large a quantity of dung. 6. Too deep, or too shallow planting. 7. Every external impediment that may injure new plants. 8. Too stiff ground, or such as has been pressed down too closely on the sets. 9. An unfavourable state of the weather, while the crop is young. ....The result of the writer's inquiries briefly is, that, if the curl be not a *disease*, but merely an *incidental debility*, it may be prevented by diligent attention to all those circumstances; which, according to experience, are essential to the cultivation of potatoes.

It is difficult to decide, amid this difference of opinion among *practical* agriculturists; but, as these roots materially contribute to the comfort of mankind, we have discussed the subject at some length; and shall now concisely state those remedies which have been successfully adopted. These are, steeping the sets for two hours, in a brine made of *Whitsters'* ashes; changing the seed, raising new kinds from the seed, or apple of the plant; or renewing the same sorts again from the same seed: and, lastly, salt is said to be an excellent preventive against the depredations of the grub.

Beside the curl, potatoes are liable to two other disorders, viz. the *scab*, which consists of excrescences that arise in very dry seasons; and the *canker*, which is occasioned by small cavities, that appear in wet weather. These defects have been conjectured to be in some measure the cause of the curl; and they increase, according to the length of time the potatoes remain in the earth, after the roots have attained to maturity.

[In a communication to the British Board of Agriculture, Dr. De Salis, states, on the authority of an intelligent person in his service, who farmed with his father in Ireland; "that potatoes whether in their parent bed, or in the pit in which they are preserved, after being dug up, by being uncovered, '*take the wind*,' and become unwholesome food to man," such potatoes however answer for seed, and for feeding hogs; they are of

a different colour from those that lie deeper.

Mr. DAVID URIE of Edinburgh, states in the report of the *British Board of Agriculture* p. 166, that he had heard farmers say, there were two kinds of eyes in almost every potatoe: the one prolific, the other not. The former was sunk deep in the potatoe, and produced a strong vigorous shoot, which in favourable circumstances, had a fair chance to have a good crop. The latter did not sink so deep, and always, had a little swelling or protuberance in the middle; from which protuberance a few weak shoots sprung forth, that even in favourable circumstances, had but a scanty crop in comparison with the other.

Mr. URIE, has his doubts about the correctness of the observation, but justly observes, that "in agriculture every remark, whether true or false, that is made by farmers should be attended to;" and on this principle the editor communicates the hint.]

Manure for Potatoes.....Lord DUNDONALD says, "that long dung is always to be preferred as manure in the culture of potatoes; for, dung completely rotted, frequently causes this crop to be watery and worm-eaten. Many farmers only apply coarse straw or litter, whence it might be imagined, that the benefit arising from such an application, must be more dependant on the straw mechanically keeping the ground open or loose, than in contributing, by any part of its own substance, to the growth of the potatoes, which cannot well be supposed; as the straw, in digging up the potatoes, is generally found in an undecayed state. It is highly probable that the atmospheric air contained in the interstics of the soil, thus made by the straw, may suffer a degree of separation, or decomposition in its imprisoned state, by which the pure air may combine with the straw, and inflammable or vegetable matter in the soil; while the azote or phlogisticated air will contribute to the growth of the plants." In the sandy soil of New-Jersey, long dung is used with excellent effect in raising potatoes and asparagus, and from the reasonable explanation of Lord D. may be used with similar advantage in other soils.]

The proper time for digging up potatoes, is in the dry weather of autumn, when the leaves and stems begin to decay. If they are cultivated on a small scale, this work is performed by means of a three pronged fork, furnished with flat tines: but, when raised in fields, the roots are turned up by a plough, the coulter of which is taken out, to prevent them from being cut. After those, which appear on the surface, are collected, a pair of drags is passed over the whole; in order to separate and expose such as may adhere to the clods.

[In the report on the agriculture of the county of Hereford, drawn up for the British Board of Agriculture, is a description of an excellent implement, invented by Mr. YELDALL, for taking up potatoes, having four prongs on barbs of iron with a fang, in the form of a double mould board plough, drawn by three horses or four oxen. It enters the ground, under the bed of potatoes, and throws the whole to the surface. A plate may also be seen in the publication of the *Board of Agriculture*, on potatoes.]

The potatoe is one of the most

valuable roots for culinary uses: when boiled, it forms a principal article of food, and serves partly as a substitute for bread. Mixed with wheaten flour, fermented with yeast, and properly baked, it makes a wholesome and nutritious loaf: the most economical method of preparing these roots, we have already stated, (vol. i. p. 371.)

Potatoes are likewise serviceable in fattening hogs; but, if the latter be designed for bacon or hams, it will be advisable to mix gradually four bushels of ground pease, with an equal quantity of the boiled roots; which portion *will*, it is affirmed, *fatten an animal of twelve stone*....In a boiled state, they may also be given to poultry with similar effect.

[In a very interesting paper on the culture of potatoes, which is inserted in the 16th volume of the *Trans. of the Soc. of Arts*, (1798) by Mr. HARPER, we find the following facts:

"That when either beasts or pigs have been fed with flour and potatoes, after a time, they will abate in their eating; when if all the hull or bran be taken out of the flour, they will both *make up* better, and in nearly one half the time that they would, if the bran was left in.

2. There is great profit in feeding geese, turkeys, and fowls of every sort, with potatoes and meal mixed; they will fatten in nearly one half the time that they will with any kind of corn, or even meal by itself. The potatoes must be bruised *fine*, while they are hot, and the meal added, when the mess is about to be given to them. Potatoes answer for farm-horses, equally well as for feeding cattle."

Mr. BORDLEY, in his excellent *Notes on Husbandry*, 2d ed. p. 189 to 194, has incontestibly proved the superiority of potatoes as food for beasts, over Indian corn, both in respect to cheapness, and the quality of nourishment afforded by both articles.

Mr. SOMERVILLE says, that the fattening of hogs by potatoes, is much hastened, by mixing a small quantity of any astringent substance among the potatoes, especially if they shew the least tendency to purging. A little alum, or Armenian bole, may be used. Report of the *Board of Agriculture on Potatoes*, p. 143.

From the experience of Mr. BARTLEY, (secretary to the *Bath Agricultural Society*), which he has detailed in a late pamphlet, it appears, that *sheep* are very fond of potatoes, and that they thrive rapidly upon them." Boiling certainly increases their nutritious quality; this advantage may be easily obtained, and at a cheap rate, by employing the boiler of Mr. T. KIRK, which shall be described under the head WATER.]

Formerly, a kind of brandy was distilled from these roots; but the Legislature has wisely prohibited such practices.....Besides, a fine *size* may be prepared from potatoes, which will answer all the purposes of that in common use, particularly for whitening cielings and walls. With this intention, any quantity of newly-made potatoe-starch should be boiled into a paste; a sufficient portion of which ought to be mixed with the whiteing, after the latter has been diluted with water. The coat thus prepared is much clearer; retains its whiteness longer; and is less liable to crack or scale, than such

as is mixed with animal glue.... There is another economical way of employing the water expressed from potatoes in the processes of making starch or size. This liquor is useful for washing linen, whether plain or coloured, silk handkerchiefs, stockings, &c. without the aid of any ley or soap: it is said to improve rather than to diminish the tint, while it restores their original brightness, and imparts a degree of stiffness to silk stuffs, which cannot be obtained by the common method of cleaning them. It deserves, however, to be remarked, that no discoloured or otherwise damaged roots must be used for this purpose....Bakers in Germany, farther, convert the pulp of potatoes into *yeast*, by adding a small proportion (about the 8th or 10th part) of the latter, together with two drams of calcined and pulverized crabs'-claws or oyster-shells, and a similar quantity of burnt hartshorn, to every pailful of the preparation. This compound is asserted to increase the bulk of the paste, and consequently of the bread; but double the measure of it is required to serve as a complete substitute for barm...See also CHEESE, vol. ii.

Farther, the stalks of these roots, when cut in small pieces, afford a grateful food to cattle: the haulm has also been converted into paper; but it is more generally, and, we conceive, more profitably, employed for stable-litter; or, when straw is scarce, instead of thatch for cottages.....Lastly, even the *potatoe-apples* may be usefully employed in domestic economy. In the *New Swedish Journal of Agriculture* for 1796, it is directed, that such apples should be collected while in a green and hard state; then well rinsed in cold water, and put for 48 hours into a strong filtrated brine. Next, they are to be placed for six or eight hours in a colander or drain, when they ought to be boiled in good vinegar, with the addition of some spice, till they acquire a certain degree of transparency, without becoming too soft. Thus prepared, they will afford a more palatable and less hurtful pickle than either olives or cucumbers.

Potatoes being of such extensive utility, various expedients have been contrived with a view to preserve them. The most common method is, that of piling them up after they have become dry, in heaps resembling the roof of a barn; covering them closely with straw, in such a manner as to meet in a point at the top; and then slightly spreading them over with mould, which is beaten down with a spade. Some husbandmen make holes in the sides and top of the earth, in order that the air, arising from the natural heat of the roots, may evaporate; and, as soon as the steam ceases, the cavities are filled up, to prevent the effects of frost or rain. Another mode consists in depositing them in pits, and covering them with dry straw, or with the haulm of the roots; by which management, if their surface be perfectly dry at the time they are put in, potatoes may long be preserved in a sound state.

[In Pennsylvania, potatoes are commonly kept in the vault, under the bank leading to the threshing floor of the barn; and from the equable temperature of the heat therein, they are preserved very well, neither freezing nor vegetat-

ing. When necessary, the Sussex county plan, mentioned in the Report of the *Board of Agriculture* may be adopted. Holes are dug in the side of a hill six yards wide, ten feet deep, and of an indeterminate length; carts from the field unload at top, and they are taken out at the bottom which opens to the slope of the hill, where a wall is built with a door. When full, a stack of stubble or straw is built over the hole, wide and large enough for security against all frosts. In this manner, the effluvia of the roots rising through the stubble, does not occasion their rotting from heat.]

A continental writer of doubtful authority informs us, that such roots may be easily preserved from the effects of the severest frost, by placing a vessel filled with cold water immediately over them: the fluid should be in proportion to the quantity of the vegetables; and, if frozen, it ought to be removed every morning and evening; when a new supply must be instantly procured.....The same author observes, that *frost-bitten* potatoes may be rendered equally, nay, more useful than those in a fresh state. This paradoxical proposition he supports by the following directions:....Select all the roots thus injured; place them in a dry and warm place till the frost be expelled; then remove the peels, cut them in slices, and place them on wicker frames till they are perfectly dry. Thus they acquire a dark hue, lose three-fourths of their bulk, and retain only the inspissated sap, which becomes very hard and incorruptible, so that it may advantageously be used on long voyages. When reduced to powder, and boiled with broth, milk, or water, with the addition of vinegar and a few aromatic herbs, those frozen fruits are said to afford a very palatable and nutritive food.

From the 2d vol. of the *Reports of the Society for increasing the Comforts, &c. of the Poor*, we shall extract an interesting paper on the preservation of potatoes, by Mr. MILLINGTON.....According to his statement, three pounds of potatoes were peeled, rasped, and put in a coarse cloth between two boards, in a napkin-press, till they were compressed into a very thin cake, that was placed on a shelf to dry. The roots yielded, on expression, about one quart of juice; which, being mixed with an equal quantity of cold water, deposited in the course of an hour, upwards of one dram of white flour or starch, in every respect fit for making fine pastry....Mr. M. presented in 1799 to the above-mentioned Society, a cake, which had been thus prepared in the year 1797. In bulk, it occupied only one-sixth part of the original roots; and lost about two-thirds in weight by the process; but he observes, that such cake, when dressed by steam, or otherwise, will afford nearly the same quantity and weight, as three pounds and a half of potatoes, properly boiled...Some roots, that had been thoroughly frozen, have been managed in a similar manner; and the cake was perfectly sweet; whereas others of the same parcel, that were left unpressed, in a few days became rotten.

Mr. MILLINGTON'S second method of preserving these roots, is as follows: Five pounds of potatoes were properly cleaned and pounded in a mortar, *without being previously peeled*; and then pressed in a small wine-press into a thick cake;

the whole being completed in the manner above described. This cake also was sweet and wholesome, but did not possess the clear whiteness of the former; nor does it appear that such as were prepared according to the last process, will remain sweet for the same length of time as those consisting of *peeled* potatoes.....At all events, this contrivance deserves to be farther pursued and improved; for, independently of the immediate advantages that will result from supplying mariners with vegetables, it is an object of the greatest importance, when considered as a mean of preserving so useful, though perishable, an article for years; and of laying up a store in plentiful seasons, against the time of scarcity.

Another mode of keeping potatoes, was lately and successfully tried, by the Bath and West of England Society; and which certainly is less complex than that before described. It consists simply in slicing potatoes, without taking off the rind or skin, and afterwards drying them in an oven or kiln. The roots thus prepared will remain sweet for almost any length of time: the Society sent some to Jamaica in a barrel; which had been *four years* from Britain, and, on their return, were found not to be in the least degree affected.

[The propriety of this method of preserving potatoes, would seem to be confirmed, by the following communication, taken from the London Commercial and Agricultural Magazine; the communication is signed "A West-India sea captain," and dated "Liverpool, March 24, 1802."

"I have made some efforts of late years, towards improving and extending the common methods of preserving stores on board ship: and the result of a few of them I take the liberty of sending to you, for the use of your publication, if esteemed worthy of notice.

"Finding the potatoe the most useful of all vegetables, I have had recourse to every possible means of preserving it. I have found this root most effectually preserved by slicing and gently baking it. After this process, it will keep sweet for years. And in this state it is very serviceable to eat as bread, to boil for various purposes, or to be ground into flour, which may be mixed with wheaten flour, for many salutary and profitable uses. I have a hand-mill on purpose to grind these potatoe slices, and likewise to grind biscuits. I have always been careful in selecting a dry mealy potatoe for this use, particularly that species distinguished by the name of champions. I always order the peel of the potatoes to be scraped off, and the eyes clearly taken out (in the same manner as every judicious cook prepares this root for the table) prior to their being sliced, and dried or baked; and this will remove that strong flavour and smell of the potatoe, which would otherwise prevail in the flour. Due care should, in this case, likewise be taken in the selection of dry and seasoned casks for the reception of this food; especially if intended to be kept for a long voyage; and to ensure a certainty of continuance of dryness, I have generally packed this preparation in, what is almost the driest thing in nature, the husks

of oats, or what is called meal-seeds, which may be procured in abundance in any of the northern parts of this country, or wherever oat-meal is made."

M. Baume of France, has invented a very convenient machine for the purpose of grinding potatoes to make starch, or to obtain flour from them; a plate of which may be seen in the *Repertory of Arts*, or in the volume on potatoes, published by the British Board of Agriculture. To those who wish to pursue the grinding potatoes as a business, the machine will be found highly advantageous. For domestic purposes, a large grater will be sufficient.

POTATOE (Sweet)....*Convolvulus Batata*, L. A well known esculent root in the United States. Mr. Joseph Cooper of New-Jersey, whose improvements in agriculture have been frequently mentioned in the course of the present work, a few years since, introduced the following excellent mode of raising this nutritious vegetable.

He plants his seed potatoes in a hot-bed, and cuts off the sprouts, and plants them in their destined spots in the field. Three or four sprouts are placed in one hill. The advantages of this method are, that the potatoes are raised at a more early period than in the old way, much seed is saved, and the great trouble of weeding avoided; for the sprouts grow so fast, that they suffocate all rising plants in their immediate vicinity.

Sweet Potatoes, especially those with red skins, yield a considerable quantity of farinaceous matter, which forms a fine nutritious jelly when mixed with water. Bowen's *patent Sago*, is this powder, which was for a long time prepared by the above person, at Savannah, in Georgia, chiefly for the British army. The process was similar to that which is well known in Europe, for procuring the flour of the common potatoe, viz. grating the clean roots, washing the mass through brass sieves of different sizes, and collecting the flour at the bottom of the vessel which receives the fluid; finally, drying it in pans either in the sun, or by a fire.]

POULTICE, an external application employed for promoting the suppuration of tumors, or abating painful inflammation; and which is sometimes also called a *Cataplasm*.

Poultices are generally prepared of bread and milk, to which are added oil, lard, or other unctuous matter, to prevent their adhesion to the parts inflamed. In large hospitals, the consumption of these articles for such purpose being very considerable, while the bread and milk are liable to become sour in warm weather, the following ingredients have, by Mr. T. Payne, surgeon, been proposed as substitutes:...Take, of the finest pollard, three parts; of genuine linseed flour, one part; both by measure; and, of boiling water, four parts: mix these ingredients with a spoon or a broad knife; and they will, in general, form a poultice of a proper consistence, without requiring oil, lard, or other emollient ointment: though, if the inflammation be considerable, a small quantity of oil may be added, to prevent adhesion.

POULTRY, a term including every kind of domestic fowls which are reared about yards, such as cocks, hens, ducks, turkeys, &c.

Poultry constitutes part of every farmer's stock, but the rearing of

it is, in this country, seldom productive of any pecuniary advantage; for, though fowls are considered chiefly as an article of luxury, and sold at high prices in the market, they never repay the value of the corn which they have consumed, especially if such grain must be purchased. Where profit is the object of the husbandman's labours, no poultry should be admitted into the vicinity of *barns*; unless for the purpose of picking up scattered grain: though, in general, it cannot be denied, that they acquire their fat substance from the corn left in the straw, by negligent threshing...For the most economical methods of rearing fowl, the reader will consult the articles COCK, HEN, DUCK, GOOSE, TURKEY, &c.....See also CHAFER.

PREGNANCY, a certain state of the animal body, which requires no farther explanation.

The first duty of persons, in that prosperous condition is, a constant and redoubled attention to all the surrounding and occasional causes which may be productive of injurious effects on their constitution. Thus, prudent mothers will greatly contribute to the future health and welfare of their children, by avoiding every violent and depressing passion; living regularly in all respects; and especially by taking proper or moderate exercise in the open air. These few hints cannot with too great earnestness be impressed on the female mind; as every comfort, or misery, connected with family life, will, in a great measure, depend on the conduct pursued during that important crisis. Hence persons, thus situated, ought to be extremely vigilant over the vagrant effusions of fancy, and not suffer themselves to be misled by the frequent, though momentary impulse of an excited imagination: the happy consequences of such a system would be felt by future generations; because every neglect, of which they are guilty at this period, cannot fail to be productive of physical and moral detriment to those who are the dearest pledges of their existence. Nor should they indulge beyond the bounds of reason, in the eating of any strange dish, or drinking particular liquors, to which they are not accustomed; as desires of this nature must be ascribed to an *unnatural appetite*.

It is an indisputable truth, that in the present improving state of society, we possess no distinct treatise on a subject of the highest importance to the prosperity of mankind; namely, a popular work on *pregnancy*, in which scientific rules are delivered with such a degree of delicacy as to convey plain instructions, in a correct and pleasing manner. Until this great desideratum be fulfilled, we are inclined to repeat the just complaints of SOCRATES against his cotemporaries, that they cultivated the art of rearing good horses, but neglected that of educating their childen.

[PRENANTHES AUTUMNALIS. Dr. WITTS' *snake root*, or *rattle snake's master*. A native hetorophyllus plant, and of considerable beauty; growing from four to five feet high, with an erect stem, branching towards the top. The flowers are in corymbs or clusters, of a sky blue colour. This plant abounds in a viscid

milky juice, of a very bitter taste, and has obtained some credit as a remedy for the cure of the bite of a rattle snake: but no satisfactory testimony has been published of its title to so important a claim.]

PRESERVATION, in domestic economy, is the art of preserving animal and vegetable substances, with the least trouble and expence.

In the articles BACON, BEEF, BUTTER, CHEESE, FLESH-MEAT, PICKLE, &c. we have already pointed out various new and effectual contrivances for preventing the corruption of *animal* food: and though we likewise treat, in the progress of the alphabet, on the most useful vegetable bodies, and introduce the best methods of preserving them in a fresh state, yet we cannot neglect this opportunity of communicating to our readers a *general fact* of the utmost importance to the maritime interest of this country.

A philanthropic Livonian clergyman, Mr. EISEN, in the year 1772, published a few sheets in the German language, of which the following is the substance:.... After numberless experiments made with a view to ascertain the relative moisture contained in different plants, this excellent man has clearly convinced the world, by actual proofs laid before the late FREDERICK the Great, of Prussia, that "vegetables may be preserved in their natural state, so as to retain their juices, their colour, taste, and alimentary properties) for a series of years, by a proper method of drying and packing them."....As we propose to describe this simple process, under the article VEGETABLES, let it suffice to observe, that eight tons, or 32,000 pounds of fresh herbs and roots, may thus be concentrated into the compass of 16 cwt. or the twentieth part of their bulk, so that a single horse may remove with ease, what otherwise would have required the united efforts of twenty.

PRICK-TIMBER. See SPINDLE-TREE.

PRICK-WOOD. See Wild CORNEL-TREE.

PRIM. See PRIVET.

PRIMROSE, or *Primula*, L. a genus of plants comprising 19 species; four of which are indigenous: the following are the principal:

1. The *vulgaris*, or COMMON PRIMROSE, is perennial, grows in woods, hedges, thickets, and on heaths; it flowers in the months of April and May....The blossoms of this species form an ingredient in pectoral teas; and the young leaves may be eaten in the spring among other culinary herbs...Bees visit the odoriferous flowers, which are also said to impart briskness to wines. The roots, immersed in a cask of beer, or ale, render it much stronger.....LINNÆUS asserts, that silk-worms may be fed with its leaves....Sheep and goats eat this plant; but cows do not relish it, and it is wholly refused by horses and hogs.

2. The *veris*. See COWSLIP.

3. The POLYANTHUS, a beautiful exotic species, which is cultivased in gardens, on account of its fragrance. It is one of the earliest spring flowers, and numerous varieties have been raised by gardeners; some of which are so greatly admired, as to be sold at *one guinea* per root. These are propagated from seed, which ought

to be sown in December, in boxes of light rich earth, and slightly covered. When the young plants appear, they must be sheltered from the heat of the meridian sun; and, if the spring be dry, it will be requisite to water, and keep them in the shade....In the month of May, they may be re-removed into rich shady borders, that have previously been manured with neats'-dung, where they are to be set at the distance of four inches, till they have taken root. Here they must be carefuly ly weeded; and towards the end of August, they should be finally transplanted into borders of rich, light earth, in rows of six inches apart, and occasionally watered. At an early period of the succeeding spring, the plants will flower; and, if intended to be preserved, it will be necessary to remove them, when their time of blowing is past, into another border of similar soil; where, being weeded, and sheltered during the winter, they will produce strong and beautiful flowers in the following spring.

PRINT, an impression taken from a copper-plate.

As prints are more durable than paintings, and form a valuable part of the furniture of almost every house, we shall subjoin a method of cleaning and bleaching them, in case they become stained by accident, or otherwise soiled. It was invented by Signior Fabbroni, an Italian chemist, who published it in Brugnatelli's *Annali de Chimica*....He directs a strong glass bottle to be half-filled with a mixture of one-fourth part of red lead, and three-fourths of spirit of salt, and to be closely secured by a glass stopper. The vessel is then to stand in a cool shady place, till a certain degree of heat, which is spontaneously produced, indicates the forming of new combinations. The *minium* loses a considerable portion of its oxygen, which unites with the liquor, and communicates to it a rich gold colour, together with the smell of oxygenated muriatic-acid (bleaching liquor); and a small quantity of lead is held in solution, which does not however, lessen its effects.

In order to employ the liquid, thus prepared, a border of white wax should first be formed, about two inches in height, upon a large pane of glass: on this, the prints must be laid, in a ley made either of fresh urine, or water mixed with a little ox-gall, for the space of three or four days; at the expiration of which time the liquor must be supplied with warm water, that ought to be changed every third or fourth hour, till it is poured off perfectly clear. Should any resinous matter remain on the prints, they must be moistened with a little alkohol.

The moisture must next be drained; and the print, being again placed on the plate of glass, ought to be covered with the oxygenated muriatic-acid liquor. Another pane is then to be placed on the lower one, to prevent any dangerous consequences arising from the pernicious vapour of the acid. In the course of one or two hours, the most discoloured prints will be restored to their original beauty. Lastly, after pouring off the acids, the prints must be washed two or three times in pure water, and dried in the sun.

[PRINOS. A genus of shrubs, comprehending two species, both

of which are natives of the United States, viz. *Prinos Glaber*, and *P. Verticillatus*. The last mentioned species only shall be noticed.

This tree is commonly called *black alder*, or Virginia winter-berry. It grows in moist places, generally sending up several slender stalks, to the height of ten feet.... The inner bark of this tree, applied as a poultice, is much used for promoting suppuration in tumors; and, a decoction of it for preventing the progress of mortification in wounds, fractures, and ulcers..... Joined with the bark of the root of the *Leriodendron* (poplar), or sassafras-root, formed a fashionable and successful remedy in the country, for the intermittent fever. The virtues of this medicine, certainly deserve attention from physicians.]

PRINTING, the art of taking impressions from figures or characters, on paper, linen, silk, &c..... It is divided into three distinct branches; namely, 1. From copper-plates, for pictures, which is denominated *rolling-press printing*. 2. From blocks, on which birds, flowers, and other representations are cut, for printing linen, cotton, or similar articles; and which is known under the name of *calico-printing*. 3. From moveable letters, for multiplying books, and which has received the appellation of *letter-press printing*.

The branch last mentioned, is undoubtedly the most curious and valuable; as to its general dissemination, may be chiefly attributed the progress of learning; the numberless discoveries and improvements in the arts and sciences, together with a variety of other valuable contrivances in domestic life, that must otherwise have been confined to the knowledge of a few individuals, if not totally lost to mankind. Hence, several cities have contended for the honour of its first introduction; but the claim is confined principally to Haarlem, in Holland (where it was invented by LAURENCE COSTER), and to Mentz, in Germany (where FAUST and GUTTENBERG were the first printers): to each of these it may in some measure be ascribed; the printing with *separate wooden types* being first practised at Haarlem in 1430; as that with metal types (which were first cut, and afterwards cast) was discovered at Mentz, in the year 1444 or 1445.

From Holland, the art of printing was introduced into England, about the middle of the 15th century: it was first carried on at Oxford; whence it has been diffused to every quarter of the island, and is now brought near to the acme of perfection....A more minute account of the history of this valuable art, will be found in Mr. AMES's *History of Printing* (3 vols. 4to. 3*l*. 13*s*. 6*d*. 2d edit.); and in Messrs. BOWYER's and NICHOLS's *Origin of Printing* (8vo. 2d edit. 5*s*. boards.

In the year 1795, the *Society for the Encouragement of Arts*, &c. conferred a bounty of 40 guineas on Mr. RIDLEY, for his invention of a *Printing-press*, on a new construction; but, as a description of its mechanism would be intelligible only to printers, the reader is referred to the 13th vol. of the Society's "*Transactions*;" where it is accurately described, and illustrated with an engraving.

[PRINTING, (Callico). This business has been particularly carried on by Mr. HUSTON, for some years at Kensington, and lately,

and more extensively by Mr. STEWART, at Germantown, and by Mr. THOBURN, at Derby in Delaware county.....It is pleasing to know, that the prints of these manufactures meet with a ready sale, notwithstanding all the disadvantages arising from European importations, and the want of protecting duties, and in the face of the constant cry of the silly or interested, that we are too young to manufacture; that labour is too dear!

The editor is happy in being able to lay before his readers, an ample set of instructions for the business of callico-printing, with which he has been favoured by THOMAS COOPER, Esq. of Northumberland; whose excellent remarks on various topics, have greatly added to the value of the present work.

Goods intended for printing, are usually sent bleached; if they are not quite white enough, boil them for two or three hours, in an alkaline ley, allowing about two pounds of ashes to each piece of velvet, fustian, or calico. Then dash them well, or wash them well out in hot-water.

It will then be necessary to sour them in an acid, of 1 part strong oil of vitriol to two hundred parts of water; immerse them in this acid for about twelve hours; dash them extremely well, or else rinse them for a sufficient time in hot water. If the ashes remaining in the piece after bleaching, are not perfectly neutralized by the acid, they will act as mordants for the colours, and the white part will never come clear: if the acid is not well worked out, the piece will be rotted in the storing.

Of the different modes of printing.

These are, 1. Chemical colours; 2. Raised colours; 3. Pencil colours; and 4. Paste work.

1. *Chemical colours*, are such, as when applied to the piece by the blocks, require no farther process, than that of being passed through a decoction of dung, and then through hot water.

2. *Raised colours* are two-fold. In the first, a compostion is painted on the cloth, to serve as a basis, or mordant, as it is called, for some decoction of colouring substance to strike upon, through which decoction, the piece is to be passed. In the second case, a corrosive composition being applied to the cloth, that it requires to be again passed through a saline composition, to neutralize and precipitate the colour.

3. *Pencil colours* are chemical colours, applied with a brush or stick after the piece has been printed with raised colours, and finished off; they are so applied, because they would be injured by the raising of the other colours. They are laid on with a pencil or brush instead of a block, because the piece has been so much stretched and altered by printing and raising the other colours, that a block would not fit well in, with the pattern.

4. *Paste work*, is where an adhesive composition is laid upon the piece in those places, intended to be white, so that when the piece is dyed, the colour may strike upon those places only which are not covered with the paste. This last is separated by steeping in a weak acid, and then washing in warm-water.

CHEMICAL COLOURS...In the following receipt, *one part*, means, one part by weight; wherein also by 1 lb. of water, is understood, one English pint.

Black....Vinegar, 64 parts; powdered blue galls, 16 parts; green copperas, 3 parts; boil the whole forty minutes: when cold, add about $\frac{1}{2}$ a pint of nitrated iron, *Mud*, water 8 parts; powdered galls, $\frac{3}{4}$ of a part; madder $\frac{1}{4}$; green copperas $\frac{1}{4}$; ground logwood $\frac{1}{4}$; *Spirit of Salt* $\frac{1}{5}$; dilute according to the required colour.

Emperor's Eye.....Green copperas one part, powdered galls one part, or sumach $1\frac{1}{2}$ parts; put them in a bag, and boil them in eight parts of water for ten minutes.

Stone....Vinegar 6 parts, chemical black 2 parts, boil them gently for a few minutes.

Drab...Water, tar acid and decoctions of sumach, of each 1 part; green copperas $\frac{1}{4}$ of a part; sal-ammoniac $\frac{1}{32}$ of a part, dissolve all together.

Salmon....Water 24 parts, madder 3 parts, sumach 3 parts, alum 3 parts, boil them for one fourth of an hour.

Purple....Sour ale 8 parts, logwood 2 parts, alum $\frac{1}{2}$ a part, boil them for an hour, and add $\frac{1}{4}$ part of solution of tin in nitrous acid.

Red....Powdered galls $\frac{1}{16}$ part, brazil-wood 2 parts, stale beer 12 parts; boil them and add $\frac{1}{8}$ part powdered alum; strain the whole, and add $\frac{1}{4}$ part of nitrous solution of tin.

Olive....Decoction of quercitron bark 8 parts, green copperas $\frac{1}{4}$ part, blue copperas $\frac{1}{8}$ part; then dissolve them.....The following is a better receipt:

Strong liquor from French berries, with some weld in it, and about a tea-cup full of saturated solution of iron in aqua fortis, to three gallons of the liquor, thicken with fine flour.

Yellow.....Infuse two parts of quercitron bark in eight parts of water, for 12 hours. Then heat it, but do not let it boil; add eight parts more of water, and two parts more of the bark, and warm it again for about $\frac{1}{4}$ of an hour; add $\frac{1}{16}$ part of powdered galls; stir it well, and let it rest $\frac{1}{2}$ an hour. Strain it, and to each part of the decoction thus strained, add $\frac{1}{16}$ part of nitrated copper, after which stir it well, and let it settle for 12 hours.

Green....To the above mixture, add $\frac{1}{2}$ part of logwood at the same time the galls are put in.

Blue.....Vinegar 8 parts, logwood 1 part, blue copperas $\frac{1}{4}$ part, boil these together, and then add $\frac{1}{2}$ part of verdigrease dissolved in 8 parts of water.

Saxon Blue....Spanish indigo very well ground 1 part, flour of sulphur 1 part, very strong colourless oil of vitriol 8 parts. Let these stand together in some glazed earthen vessel, for at least two days: then add 32 parts of hot-water in which about one part of bran has been steeped: stir the whole well.

Saxon Green....To the preceding mixture add 8 parts of strong fustic liquor, and $\frac{1}{16}$ part of red orpiment.

All the preceding colours are to be mixed with gum liquor, according to the thickness of the colour, so as to make them work easily.

RAISED COLOURS WITH MADDER....*Black*...Iron liquor 16 parts, logwood 3 parts, boil them together one hour: then add 2 parts

of powdered galls, and $\frac{1}{2}$ part of green copperas. Bring them to a boil in half an hour, and then add $\frac{1}{5}$ part of nitrated iron. Strain the whole while hot and thicken with 5 parts of gum (that is $2\frac{1}{2}$lb. to the gallon).

Red.....Water 116 parts, alum 98 parts, sugar of lead 56 parts, verdigrease, $3\frac{1}{2}$ parts, stir them well from time to time, until the whole is dissolved. Mix seperately in a brass pan $4\frac{1}{2}$ parts of chalk, and $2\frac{1}{2}$ parts of red arsenic : boil them in 56 parts of water for ten minutes; then add this mixture to the former, stirring the whole well together. When cold, mix with gum to the proper thickness.

The following is a better receipt. Make a decoction of good brasil, (Braziletto, or nicaragua are not so good.) Precipitate the colouring matter in the form of a cake, with a very dilute solution of good tin in spirits of salt. Collect all the sediment after it has gradually subsided. When this sediment is almost dry, dilute it with a weak solution of tin in marine acid, (spirit of salt,) thicken with flour or gum, and use it; the room must not be too warm.

Pale-red....Water 2 parts, alum $\frac{1}{3}$, white arsenic $\frac{1}{2}$, pearl ashes $\frac{1}{16}$, chalk $\frac{1}{16}$, boil and mix with gum. A paler red may be mixed, by diluting the former.

Pink-red....Decoction of Brazilwood 8 parts, alum two parts, pearl-ash $\frac{1}{4}$ part. Let them ferment, and decant the clear liquor and thicken it for use.

Dark Brown Red....To the first receipt for red, add iron liquor in the proportion of one part of the latter to three parts of the former.

Laylock Purple....Iron liquor 8 parts, creme of tartar $\frac{1}{8}$, salt-petre $\frac{1}{2}$ part, corrosive sublimate $\frac{1}{64}$ part; thicken with gum.

Common Purple....Salt-petre 1 part, creme tartar 2 parts, pearl-ashes $\frac{1}{3}$ part, iron liquor 12 parts.

Light Purple....The above diluted with $\frac{1}{2}$ more of water.

Dark Purple....Two parts iron liquor, $\frac{1}{10}$ sugar of lead, 2 parts of water.

Blossom....Eight parts iron liquor, $\frac{1}{4}$ salt-petre, dissolve these hot, and add $\frac{1}{2}$ part printing or red colour.

Pompadour....Black and red liquor equal parts, thickened with gum, dissolved in urine.

Chocolate....Iron liquor, 2 parts, light purple liquor 2 parts, red colour 2 parts.

Puce....Eight parts red colour, 2 parts iron liquor, water 2 parts.

French Grey....Hot iron liquor 8 parts, sal ammoniac 8 parts, water 64 parts.

Stone....Salt-petre 1 part, sugar of lead $\frac{1}{2}$ part, green copperas $\frac{1}{4}$ part, water 16 parts.

Stone....Salt-peter 1 part, sugar of lead $\frac{1}{2}$ part, green copperas $\frac{1}{8}$ part, Water 16 pints.

When the pieces are printed, they must be dried in a hot stove, then passed through a decoction of cow-dung, which should be hot, *but not boiling*. Velverets must be thus rinsed through, about 40 times; Jeanets, &c. about 20..... The instant after they are thus dunged, they must be washed in the dash-wheel, or they will be spoiled. When well dashed, put them into a copper of cold water, with 2lb. of Madder, and 1-2lb. of

sumach to each piece of velveret, and 1-2lb. Madder and 1-2lb. sumach to a Jeannet. The sumach is not necessary to all colours, and it would spoil purples. Bring the liquor to a brisk scald, (boiling injures the colour of the madder). Rinse your pieces in this decoction, till the colour is deep enough.

Stream and wash your pieces well: then put them into a copper of warm water, with 1-4 hoop of bran to a piece; keep them in at a brisk scald for half an hour: stream them, and again put them into the bran copper for 1-4 hour more. If not white enough, lay them down on the grass for a few days.

ADDITIONAL OBSERVATIONS.

In making the dung liquor, put about a strike (or bushel) and half, for 8 pieces of calico, or 5 of velveret, which may be renewed for the next 8 (or 5) with a piggin-full more. The coppers should be from 3 ft. 6, to 5 ft. over, and should have a nozzle and plug (not a cock) to let out the waste liquor. No more than 8 pieces of calico should, on any account, be rinsed at a time, *even* 10, occasions a hazard of bad work. The cow-dung prevents the colours from spreading, and fixes them. The cow-dung should be well washed out by streaming thro' a pit about four feet wide, and long at pleasure, supplied with a stream of water; or else the pieces should be dashed in a dash-wheel. The quantity of time employed on an average (including chintz patterns) to get a piece of goods into the market, from the green state, is two months, of which, one is occupied by the bleaching, and one by the printing.

The pieces being maddered, (in which process bleach grounds will take about 5lb. madder) washed, laid down on the grass, and washed again, are calendered. Such as require it are then pencilled, after which, they are dunged, unless for pencil blues, and greens, which do not require it. They are then laid down, washed, dried, and calendered for market. To assist the drying, they use plane-tree squeezers or calenders, at which one man delivers and another receives four pieces at a time: the squeezers are set so, as that no water will be wrung out of the pieces when squeezed. The squeezers however, will burst all other pieces but calicoes. The pieces hung up to dry, are taken down somewhat damp.

For pencilling, quercitron bark is used often instead of weld.

Patterns are procured (in England) from two sorts of people..... 1st. Those who go about selling patterns (some of which cost 10*s*. 6*d*. a-piece); and 2dly, From the block-cutters, who will not only cut a given pattern for hire, but also furnish patterns ready cut. On these, and the cutters, you employ yourself, you must depend for the choice of patterns, as they are generally well informed of the taste of the market. It is absolutely necessary, however, to employ cutters yourself in any case, to repair the blocks, damaged by accident or careless cleaning. If, however, you dispose of your goods by commission, your broker is another source of procuring patterns, as the pattern-cutters always apply to the commission-brokers.

As many dyers as are wanted to raise the colours, so many men

are wanted to take the goods from them to wash, lay down to bleach, wash again, squeeze, dry, &c.

A printing shop should be nine yards wide, for a double row of tables, and five yards for a single row.

Establishment for 12 *tables, exclusive of dry-houses, ground, dash-wheels and bleachery.*

12 Tables.
72 Blocks (not less).
40 Tubs and sieves.
3 Coppers, 4 or 5 feet over.
Winces, brushes, &c.
Drugs, exclusive of madder.
Madder. Cloth.
A printing shop and stove in it.
A stove for drying. A calender,
Squeezers, block-wood, and cutting-tools for the cutter,
Drug-room, for bark, weld, madder, sumach, sacch. sat. alum, &c.
A dye-house for maddering,
A man and tear-boy to each table,
2 Dyers and two boys,
2 Bleachers and two boys.

COLOURS TO BE RAISED IN WOULDS.

Black....Aligar 3 gals. Galls 7 1-2lb. Logwood 1 lb.: boil them moderately for an hour, and to every gallon of the clear liquor, add, when cold, 1 quart of nitrated iron. After printing, let the colour lie on three days.

Yellow....3lb. alum. 1 1-2lb. sugar of lead. 2 1-2 oz. verdigrease. 7 oz. whitening, dissolve in 1 gallon of water.

N. B. Fustic is nearly as fast as weld, but both fustic and weld stain the ground, quercitron bark somewhat less, yellow berries less.

Light Olive...3lb. alum. 1 1-2lb. sacc. sat. 6 oz. verdig. 6 quarts iron liquor, to be prepared cold.

Middle or Yellow Olive....7 1-2lb. alum. 3lb. sugar of lead. 6 oz. verd. 9 quarts iron liquor. 3 quarts water, to be prepared cold, and the ingredients stirred for 3 days.

Dark Olive....1 lb. alum. 1-2lb. sacc. sat. 2 oz. verdigrease, 1 gallon iron liquor.

Mud....2lb. galls, 1 pint water. 3 gallons iron liquor.

Another Mud....3 quarts water. 8 ditto iron liquor. 4lb. copperas. 6 oz. verdigrease.

Stone...3 pints vinegar, and 1 pint black colour.

To raise the above colours, stove and dung them as directed for madder colours.

For a velveret take 1-2 bundle of welds; for a jeanet somewhat less: boil the welds in your copper for half an hour; take them out and put your piece in the decoction, keeping it at a brisk scald, but *not boiling*; wince as usual till the colours are deep enough. Put a pound of galls or sumach into your bran, and if the blacks are not good enough, add more. Bran as directed for madder.

COLOURS TO BE RAISED IN WOULDS AND MADDER.

Black, Stone, and Mud.....The same as for woulds or madder.

Orange....8lb. sugar of lead. 7 oz. verdg. 14lb. gum. 4 gallons water.

When dissolved, neutralize with 6 oz. chalk.

Dung, and raise your piece with half a bundle welds, and then wash it, and put in a fresh copper with 2 1-2lb. madder, scald for half an hour and bran as usual.

COLOURS TO BE RAISED IN WELD AND LOGWOOD.

Black, stone, and Mud....As before.

Green....1 gal. lime-water. 6 oz. verdig. 4 oz. alum. 2 oz. sugar of lead. 1-2 oz. best ground indigo dissolved in a table spoonful of strong oil of vitriol, and neutralized with chalk. Add all together, and neutralize with whiting.

Raise as for welds, adding 2lb. of logwood.

COLOUR TO BE RAISED WITH AN ASTRINGENT ONLY.

Boil 2 gallons of iron liquor in an iron pan, and thicken it gradually with 3lb. of flour; put it in an earthen mug to cool, and when cold take off the top skin, and it is fit for use. To raise the above, dung as before, and boil in a decoction of 1 lb. logwood and 1 lb. sumach wash and bran, and if the ground is not clear, boil it in soap and water.

COLOURS TO BE RAISED IN LIME-WATER AND POT-ASH.

Black....Aligar 3 gallons. Galls 7 1-2lb. boil and then add 4 or 6 oz. copperas to each gallon.

Mud....1 gallon of water. 1 1-4 lb. blue galls. 1 1-2lb. Brazil wood. 4 oz. copperas....this last to be added when the other ingredients are well boiled. Dilute or otherwise, according to the pattern.

Stone....1 quart chemical black, without the nitrated iron; and 1 quart water.

Fawn....1 pint chemical black, 5 pints pale red.

Gold....Dissolve 9lb. copperas in 6 gallons of iron liquor, thicken with 3lb. of gum, or 3 1-2lb. of flour per gallon.

Buff....6 gallons of iron liquor boiled, to which add 2 gallons of gum water.

Violet....1 gallon fresh cold logwood liquor. 2lb. alum. 1 lb. sacch. sat. and 4 oz. salt-petre dissolved in part of the liquor....add 1 pint boiled iron liquor, and then 2 oz. pearl-ash. N. B. This colour raised in madder, gives a crimson red....in welds, a full green olive.

After printing your pieces run them through a cold solution of 6 or 7lb. of pot-ash, and then through another, with about 7lb. of quick-lime....then wash them well.

COLOURS TO BE RAISED IN LIME, COPPERAS, AND POT-ASH.

China Blue....Grind together in gum water, equal quantities of indigo and copperas extremely fine, add 2 quarts gum water...print the piece....then pass it through lime water in the proportion of 2lb. of lime to each gallon of water. Then for 15 minutes, through a solution of copperas in the proportion of

1lb. copperas to each gallon. Then through a solution of pot-ash in the proportion of pot-ash sufficient to make the solution bear an egg; wince it for 20 minutes. Then plunge it immediately in cold water, and wash it well. Should you want to discharge the colour, boil it in caustic alkali.....Any other raised colour may be printed after the blue is raised.

PENCIL COLOURS.

Blue....To 20 quarts of hot water in a copper pan, add 20 oz. of sifted quick lime, and 10 oz. flora indigo, ground extremely fine: boil slowly for 20 minutes, stirring it all the time: when cold, add 8 oz. red arsenic, boil it again 10 minutes longer, and then add 2 quarts of gum water.

Green....four oz. fustic, one oz. of green vitriol one quart of water ....boil them, and thicken with starch: then add as much as you wish of pencil blue.

Yellow....1-2 an oz. turmeric in 1-2 a pint spirits of wine....add to it 1-4 oz. of saffron dissolved in 1 quart of water, (more or less) as you wish.

Orange.....1 lb. annatto, 1-4lb. pearl-ash, 5 quarts water.....boil them together and pour off the clear liquor for use.

Chemical Green (common work) ....Logwood, French-berry-liquor, and a little verdigrease.

A better Green...Indigo, copperas and gum water ground together... 1 lb. indigo to 2lb. copperas. If you calcine the copperas and put a little sugar of lead in it, it deepens the colour.

Mordant for 1 gallon Turkey red. Alum, 3 1-2lb. *sac. saturni*, 2lb. sal prunell. 4 oz. corr. sublimate 1-2 an oz. a little whiting.

There is another method of making chemical colours, but they do not stand the air, though they wash: and it is very dangerous to the cloth, if not well attended.

Chemical Purple....Proceed with logwood in the same way.

Chemical Yellow.....With weld, or quercitron, in the same way.

Chemical Olive...Use the preceding, with a solution of iron in sp. salt, added....or use the receipt before given.

Green....The yellow upon an indigo blue.

Blue...The common indigo blue.

DYEING.

Drab....Fustic, sumach and copperas, with alum in the copperas.

Olive....Fustic, logwood and blue vitriol, with or without, copperas, according to the shade. This will make a greenish olive. For a brown or red olive, sumach and copperas.

Mud.....Alum and copperas..... sumach.

Bloom.....Logwood and sumach, with copperas and alum: or tin in spirits of salt.

Purple.....Logwood (and if not a blue purple, Brazilletto) and tin in spirit of salt.

Chocolate and Brown...Fustic and copperas, and then logwood and blue vitriol, or if a bright chocolate is wanted, Brazill and tin.

Buffs and Nankeens.....Annatto and fustic.

Fast Buffs....Tinned iron plates in aqua fortis, and raised in lime.

Yellow.....Fustic or weld with alum or verdigrease.

Green.....Fustic, logwood and blue vitriol.

Crimson.....Brazil and tin in spirit of salt.

Garnet.....Add logwood to the above.

Scarlet....Annetto and safflower.

Black....Steep oller-bark and iron together for about a twelve month, and then run the pieces 10 or 15 times through. Dressing and rubbing them between.

Blue....Indigo in lime with copperas and yellow orpiment.

Red....Madder and alum....then Brazil and alum.

Turkey Red....Boil the cotton in soap and water weak, alum it twice, gall it twice, run it through sheep-dung, madder it twice, revive it for a slight solution of soap and water.

In common dyeing, 6 pieces per man per week, on the average..... 2 men to a copper.....coppers, 3 feet diameter....fires on the outside like the steam-engine fire.....stove of 3 stories; one of 32 feet square on the ground plan, with 2 twenty inch stoves, will be enough for an establishment of 15 men...Damper in the upper story....Scour with winses.....half a dozen casks, and some earthen cocks necessary.

BLEACHING GREY CALICOES.

The cuive should hold about 240: these will require for the first bouking, 70lb. pot-ash. Wash them well, and let them lay out two days.

Second bouking 40 lb. pot-ash ....wash, let them lay out 3 days.

Third bouking 30lb. pearl-ash, wash, let them lay out one day.

Clearing, 15lb. pearl-ash, wash, let them lay out till white.

Between the first, second and third bouking, there should be a scouring with vitriolic acid and water, of the strength of vinegar.

The dephlogisticated acids we used to make thus.

In cylindrical machines 4 feet by 5 feet, the staves 2 1-2 inches thick, the gudgeons 1 inch thick, we used when they were nearly filled with water to add 75lb. salt, 40lb. oil of vitriol, and 25lb. red-lead.... turned it three or four times, and used it next day. This would bleach 60 muslinets after they had been bouked twice, soured twice, and cleaned once.

6 grey calicoes were weighed, and they weighed 43lb.

6 ditto, bleached, 39lb.

Muslinets grey, weigh about 11 lb....bleached, about 9 1-2lb.

Half-yard velverets, grey, undressed, weigh 16lb. but when dressed, 11 lb. and when bleached about 9lb.]

PRIVET, PRIM, or PRINT; *Ligustrum vulgare*, L.; an indigenous shrub, growing on rocks in the most exposed situations towards the Western Sea, and flowering in the months of June and July.

The Privet may be easily propagated by seed, layers, or by cuttings: being a hardy plant of quick growth, it is usefully employed in making hedges. It attains the height of from ten to fifteen feet; is adorned with oblong leaves, and bears black berries containing a violet pulp, which ripens in October. Its juice, when mixed with a solution of any acid salt, affords a black; with Glauber's salt, and spirit of sal ammoniac, a red; with urine, a purplish; and, with vitriol

of iron, a green colour. On steeping these berries in a solution of salt of tartar, they yield a fine blue juice, the shade of which may be rendered still brighter by adding quick-lime. WEISSMANN, the author of the "*Franconian Collections*" (in German, vol. i. p. 312), conjectures that the incomparably *black ink* of TRAGUS, was prepared from these berries, combined with oil of vitriol. With the addition of alum, this fruit is said to impart to wool and silk a good and durable green colour; but, for this purpose, the berries should be gathered as soon as they are ripe. The purple colour upon cards is likewise prepared from their juice..... The kernels contained in these berries, produce by expression an excellent oil. The wood serves both as fuel, and for the smaller objects of turnery, but especially for pegs, as it is uncommonly firm. The branches of this shrub are useful for wicker-work, as well as for the finer kinds of baskets, on account of their great flexibilty..... As this shrub is much frequented by the Spanish fly, we conceive it might with advantage be cultivated in the southern counties of Britain, for the purpose of collecting that valuable insect. Oxen, goats, and sheep, eat the plant; but it is refused by horses.

PRIVIES are certain places of retirement, which require no farther definition. As they frequently emit an odour alike inconvenient and unwholesome, either from neglect in cleansing them, or from the low situation of the houses to which they may be annexed, such fetor may be destroyed by throwing into them a mixture of lime-water and a ley of ashes, or of soap-suds: thus, the most offensive exhalations may be effectually removed, at a trifling expence. By a similar process, vessels may be kept in the apartments of the sick, where night-chairs cannot be easily procured, without emitting the least offensive smell: for if 5 or 6lbs. of quick-lime, a small quantity of ashes, and two buckets of water, be thrown into a tub, adapted for the purpose by a proper lid, such composition will effectually prevent any fetid effluvia; and the feculent matter, thus neutralized, becomes an excellent manure. See also CLOSE-STOOL.

[POBANG, an instrument for the purpose of forcing substances into the stomach, which stick in the gullet. It consists of a piece of spunge, tied to one extremity of a round smooth piece of whalebone, to the other end of which, a portion of twine from the spunge is connected, to prevent the accidental passage of the spunge into the stomach, in case it should become loose. The spunge must be dipped in oil before using it, and then pushed beyond the obstructed part. Such an instrument might be used with success, when cattle swallow whole potatoes or apples, which they often do, and cause their death thereby.]

PRONG-HOE, an implement of husbandry, employed for the hoeing or breaking of ground near, or among the roots of plants. It consists of two hooked points, six or seven inches in length; and, when stricken into the ground, will stir, and turn it to the same depth as a plough; thus answering both intentions, that of opening the land, and of cutting up weeds..... The prong-hoe is a very useful

instrument, especially in the horse-hoeing husbandry, when the hoe-plough can only come within two or three inches of the rows of vegetables; as the land may thus be raised and stirred to the very stalk of the plant.

PRONUNCIATION, a term denoting the manner of articulating or sounding the words of a language.

Pronunciation is the most difficult, and at the same time the most defective part in grammar, the writer having frequently no determinate expression, by which he can convey a distinct idea of particular sounds: hence it becomes necessary to substitute a precarious and even vicious term. These remarks are peculiarly applicable to the English language, where the same word is often both a noun and a verb; for instance, "to present a nosegay; and, to accept of the present:" the real difference being distinguished only by the accent....To remedy such inconveniencies, it has been proposed to establish a standard of pronunciation, by means of certain visible marks; and different essays have been published on the subject. The best work of this nature, as a guide to young persons, and more especially to foreigners, appears to be, Mr. JOHN WALKER'S *Pronouncing Dictionary*, (4to. 2d edit. 1*l.* 5*s.*); by a diligent study of which, the reader may be enabled to form his pronunciation in the most appropriate manner. The author of this classical book, being a gentleman of considerable literary attainments, possesses the additional merit of a teacher, who, through a long series of years, has formed many of our best public speakers: nay, we are convinced, that the happy talent of imparting judicious precepts with a melodious, distinct, and manly enunciation, has seldom been more conspicuous.

PROPAGATION, in general, signifies the act of multiplying the kind or species; but, in this place, we propose to treat only of *vegetable* nature.

Beside the usual modes adopted by gardeners and agriculturists, of propagating trees, shrubs, &c. there are *two* other methods of multiplying plants, in a manner equally novel and surprizing.

1. *Planting the leaves*, was accidentally discovered by J. F. HENRY, a German, who died at Augsburg, in 1726. He reared many large trees, by setting healthy leaves in flower-pots containing sifted garden-mould, so that one third of the leaf was covered with earth. Over these pots, he suspended vessels filled with water, which gradually dropped upon the small plantation beneath: thus, the young stems began to strike root and grow like those reared from kernels.....HENRY was born at Stuttgard, in 1647, where at an early period of his life he made this useful discovery, which was first described by MANDIROLA, an Italian monk, who published a treatise "*On Flower-gardens and Orangeries.*" in 1679.

2. *By covering horizontal sprigs, or branches with moss*....This ingenious method of multiplying plants was lately announced by J. C. WENDLAND, an eminent gardener in Germany, who described it for the benefit of the public, nearly in the following words:...Such shrubs as cannot conveniently be propagated by seeds, sets, or by layers,

may be easily multiplied, especially if they have young branches near their roots. For this purpose, the earth around the stem ought to be previously loosened, elevated, and made nearly level with the lowermost sprouts: these should next be laid on the ground horizontally (without cutting or breaking them); then fastened with small wooden hooks; covered with moss; and frequently watered, so that the latter may closely attach itself round the branches. The operation may be performed either in the spring, or autumn: if in the former season, the moss should never be suffered to become dry; if in the latter, it must be covered with straw, to protect the layers from the effects of frost. When the moisture has softened the rind of the sprouts, young roots will strike through the moss into the soil, and numerous plants may thus be obtained in the course of one summer, sufficiently vigorous to be removed to the nursery. No biennial parent-branches, however, need be employed; as these will produce new saplings only in the second year.

PRUNES. See Article PLUM-TREE.

PRUNING, in gardening and the culture of forests, denotes the lopping off exuberent or diseased branches, with a view to render trees more fruitful; to make them grow higher, and with greater regularity; or to produce larger and better-tasted fruit.

The greatest care is requisite in the management of wall-fruit-trees, especially during the spring, when their growth is most rapid: all superfluous branches must be closely cut off with a sharp bill, in order that the wound may speedily heal. Those, however, which are intended to bear fruit in the succeeding year, ought on no account to be shortened during their growth; for such operation would cause two lateral shoots to spring from the eyes beneath the part where they were cut off: and the course of the sap would be diverted: hence it becomes necessary to remove these shoots; as they will otherwise prove highly detrimental to the tree.

Farther, Mr. BUCKNALL directs all useless buds to be *rubbed off*, immediately after they appear, and not to be extirpated by the knife; because new buds will shoot forth with increased vigour: others must be *pinched*, where new shoots are required to supply the vacancies of the wall. By this treatment, fruit-trees may be so managed, as to render the operation of pruning unnecesary during the winter.

With respect to *standards*, it will be advisable to shorten their branches only, when they are either too luxurious, or, by growing irregularly, divert the current of the sap, and consequently weaken the whole. In such case, the more vigorous sprouts ought to be closely cut down, in order to strengthen the other parts: but these amputations should not be performed on stone-fruit trees; which are very liable to become affected with the GUM, and thus, in a short time, to perish. It will, therefore, be necessary in the latter instance, to pinch the straggling shoots early in the spring....But all decaying or apparently dead branches, whether belonging to wall or other fruit-trees, ought to be pruned closely to the stem; because, by attracting noxious particles from

the air, and admitting too great a degree of moisture into the tree, such useless parts contaminate the *balsamic virtues* of the sap, and thus eventually cause the destruction of the tree, by affording a nest in which insects will deposit their eggs....Lastly, all branches that intersect each other, and thus occasion a confusion in the crown of the tree, ought likewise to be carefully removed; and, as vigorous young shoots often spring from old arms near the trunk, and grow up into the head, they must be annually exterminated; lest they should fill the tree with too much wood.

In regard to the proper period for commencing this operation on fruit-trees, especially in orchards, Mr. BUCKNALL is of opinion, that pruning should be first practised in the nursery, and regularly continued to the "extremity of old age." Thus, it will be advisable to take off only a small quantity of wood at one time; and by employing his *medication* (See CANKER), the wounds will heal without causing any more blemishes in the tree than those to which it was subject, at the time when the branch was separated. If such tree, however, be very old, and much incumbered with useless wood, it will be proper to cut off all decayed, rotten, or blighted branches, previously to the operation; and to rub them with the preparation above alluded to, with a view to exclude the cold winds: ....lastly, Mr. B. observes, that the rest may be left; to the discretion of each person, who will soon see how much is necessary; self-conviction being the best school for improvement."

The proper age, and season, for *pruning fruit-trees*, is of the first consequence; as we seldom meet with an orchard which, in this respect, has been judiciously managed. To ensure success, there is required not only the eye of an accurate observer, but also a complete knowledge of the various kinds of fruit-bearing trees, there peculiar nature, and habits; because almost every sort must be treated in a different manner..... Many of these commonly produce their fruit on the shoots of the preceding year, such as peaches, nectarines, &c. others again, on branches which have attained the age of 3, 5, 15, or 20 years; for instance, pears, plums, cherries, &c. For the proper nursing and training of all these trees, it will be indispensably requisite to attend to this circumstance, that a sufficient portion of *fertile* wood be left in every part: at the same time, it would be prejudicial to the growth and health of a tree, to leave too many useless branches, which only tend to exhaust their nutritive powers, and eventually to accelerate their decay.

On the whole, it deserves to be noticed, that peaches, nectarines, apricots, cherries, and plums, will thrive more vigorously, when they are pruned with a sparing hand; as otherwise, they are apt to *bleed* profusely, or to part with such a quantity of gum, as will often prove fatal: hence, the safest method is, to remove only the superfluous sprigs as soon as they appear, and not to cut off those new shoots, which may be required to fill up vacant spaces on the wall. By such management, the trees above alluded to, may be preserved in a prosperous condition; and they will grow with greater

regularity, and less trouble, than by the common method of clipping them promiscuously.

Apple and pear-trees ought to be treated, during the summer, in a similar manner; but in the winter, they require a different process. For, as peaches and nectarines bear their fruits mostly on the annual branches, these must be lopped according to the degree of strength observed in the individual tree; so that they may be left in a state sufficiently vigorous to produce new shoots in the succeeding year: on the contrary, pear, apple, plum, and cherry-trees, yielding their fruits on the young sprigs that proceed from boughs of several years growth, they should not be pruned; because branches which naturally abound with these sprouts, would thus increase the wood, but never afford a proportionate addition of fruit.... And, as it frequently happens that the flower-buds appear first on the extremity of the last year's sprig, such cutting of the branches would deprive the tree of its future blossoms.

With respect to the pruning of high or lofty trees, we shall briefly observe, that their branches ought not to be curtailed or removed, unless they grow too luxuriently and irregularly on one side of the stem, so as to deprive the collateral boughs of the necessary supply of sap; on account of which, other parts of the tree would remain deficient; or its roots might be too much weakened: in this case, it will be advisable to lop a branch to such extent, as may be deemed requisite for the production of lateral boughs, in order to supply the open or naked sides. These observations, however, apply only to apple and pear-trees, which shoot forth their blossoms from the branchy wood, after it has attained the age of several years: on the contrary, most kinds of *stone fruit* would, after much pruning, part with their *gum*, and speedily perish.

[The following excellent direction respecting pruning trees, have been published before: and though the substance of them is given in the course of this work, yet the manner in which they are here presented to the reader, will be of advantage, as they cannot be too strongly inforced.

"Any time in the month of March is a proper season to prune your trees: mind nothing about the moon, for she concerns herself little about you or your trees and the sign is always in the right place when it makes you industrious.... There is no part of a farm which yields so great profit with so little labour as the well cultivated orchard.

Young trees require to be pruned every year as much as the old. You should never suffer a sucker to remain near the root, from one year to another, nor by any means upon the body or trunk, which you do not intend shall be permanent.

In pruning old trees, and those which have gotten their growth, observe the following rules:

Cut away no limb near the trunk, nor indeed at any distance from it, which is too large at the place of incision to heal or to close over again, this may be determined by the thriftiness of the tree, as well as by the size. If by neglect you have suffered a limb to stand, till it has attained its growth, it must stand, otherwise by extirpating it, (unless defended by FORSYTH's

composition,) you give the tree its death wound by opening an avenue to the air and water, which induce rottenness, and in course of time the limb or trunk becomes hollow frequently to the roots.

For this reason no sprout should be suffered to remain in or near the body of the sapling which is not designed shall stand when it has attained its full growth. The long life of different orchards, soil and situation being equal, will depend more on the above management, than on any other circumstance.

In trimming an orchard, great patience and industry are required, which will be amply rewarded at the harvest. You must not only remove all the dead and dry branches, but extirpate every unnecessary twig and sucker, from each branch, to its very extremity.

The more of this labour that is performed if performed with judgment, the more thrifty will the tree become, and the fruit will not only be increased in quantity, but much improved in quality.

When the tops of the branches of your apple trees begin to die, (which will be much retarded by the above treatment) they ought immediately to be regenerated, by giving what is called a new top: This is done by cutting off a few feet of their extremities, over the whole tree, (except cherries, according to Forsyth,) so as to leave it in a proper form; if the trunk is yet tolerably sound, the new branches will grow thriftily, and bear luxuriantly, and if you wish to vary your fruit, the sprouts after one year's growth, and most frequently the same year, will be fit for inoculating, which succeeds equally well in the old as in the young trees, and with which every farmer ought to be acquainted."]

If *forrest trees* have attained a large size, it will be most advisable not to prune them, unless it be absolutely requisite; and, even in such case, very few large branches ought to be taken off. Small shoots must be lopped closely, smoothly, and in an oblique direction; but extensive arms should be cut off at the distance of three or four inches from the stem. The branches of crooked trees must be separated at the curve, sloping upwards; and one of the most vigorous branches trained, for the purpose of raising a new stem: if, on the contrary, the tree be *top-heavy*, it will be necessary to *thin* the boughs that proceed from the main branches. And, if the former continue to grow out of the sides, and the top be unable to support its own weight, such boughs as have appeared in the spring, ought to be closely pruned immediately after Midsummer.

PUDDING, a well-known dish, frequently found at the tables of our English readers.

The most wholesome dishes this nature, are doubtless those made of bread, milk, and *eggs*; and which are known under the name of *bread-puddings*. Next to these, are such as are prepared by mixing a small proportion of suet, or other animal fat, with flour, eggs, and milk. The whole must be carefully incorporated, and boiled three hours or longer, according to its size, before it is carried to the table.

A palatable dish may be obtained, by boiling half a pound of potatoes till they become soft, when they must be mashed, and rubbed through a sieve. Half a pound of

melted fresh butter is then to be combined with a similar quantity of sugar; and all the ingredients are to be mixed up with six eggs, and a little brandy. The whole is now to be poured into a cloth, and boiled for half an hour, when it may be served with some melted butter, sweetened with sugar; to which a small portion of wine may be added.

The cheapest preparations of this nature, however, are *rice-puddings*: let a quarter of a pound of rice, and double that quantity of raisins, be tied loosely in a cloth, and boiled for two hours; at the expiration of which time, it may be put in a dish, and carried to the table. Or, the rice may be boiled in a cloth for one hour, when a quarter of a pound of butter is to be stirred in, and the pudding sweetened to the taste: it should then be boiled for another hour, after which it will be fit for immediate use.

[Under the article DIET, several receipts were given, for the preparation of wholesome and nutritious dishes; to those may be added the following, for a *cottage-pudding*, which the editor can recommend to either rich or poor, as highly palatable.

"To three pounds of *dry mealy* potatoes peeled and mashed, add one pint of milk, three fresh eggs, oz. (or two large spoonfuls) of brown sugar, mix all well together, and bake quickly.]

PUFF-BALL, or *Lycoperdon*, L. a genus of fungous plants, consisting of many species, 25 of which are indigenous: the principal part of these are the following:

1. The *equinum*, or EQUESTRIAN PUFF-BALL, growing on the horns of cattle and sheep, but more commonly on the hoofs of horses which have been long exposed to, and softened by, the whether.

2. The *proteus*, COMMON PUFF-BALL; Bunt; Frog-cheese; or Puckefist; growing in pastures, and on road-sides; flowering in the month of August. When burnt, it emits narcotic fumes, on which account it is occasionally employed to *take a hive*, without destroying the bees. This species, as well as the Orange-coloured Puff-ball (*Lycoperdon aurantiacum*) is sometimes used as a styptic.

All these plants, while young, are of a roundish figure, and possess a soft fleshy substance, similar to that of mushrooms; but, when attaining to maturity, they become hollow, and are filled with an extremely subtle powder, that is very destructive to the eyes; cases having occurred of persons, who were, by coming in contact with it, deprived of their sight for a considerable time, and also affected with violent pain, and inflammation.

PULSE, in animal economy, a term denoting the alternate dilatation and contraction of the heart and arteries, in consequence of which the blood, being ejected from the left ventricle of that organ, is impelled into the arteries, so that it may circulate throughout the body: this incessant motion, or throbbing of the vessels, is distinctly perceptible by the finger.

The various circumstances by which a *natural pulse* is liable to be affected, are, by Dr. FALCONER, classed under the following heads: 1. Such as arise from bodily organization, namely, sex, temperament, and stature; 2. Such as proceed from the difference in the time of life; 3. Time of day; 4. State of the system respecting rest or activity, viz. sleep, exercise, and

mental agitation ; 5. State of the body with regard to temperature ; 6. Effects of food and abstinence : to these may be added the season of the year, the greater or less pressure of the atmosphere, and a variety of other circumstances, too numerous to be detailed..... Thus, the pulse in general beats more quickly in men, especially those of a bilious habit, than in women. In lean persons, whose vessels are large, it is much stronger than in the corpulent or phlegmatic.

Farther, the pulse is more forcible in adults than in children ; but, in the aged, it is slow and hard.... When the atmosphere is close, and productive of rain, as well as during sedentary occupations, the pulse is languid, and perspiration is diminished. In the month of May, it is quick, and sometimes even violent : as the summer advances, the rapidity of circulation, though remaining nearly uniform, is considerably reduced in strength ; so that in autumn it is slow, soft, and weak; but, on the approach of winter, the pulse becomes hard and strong.

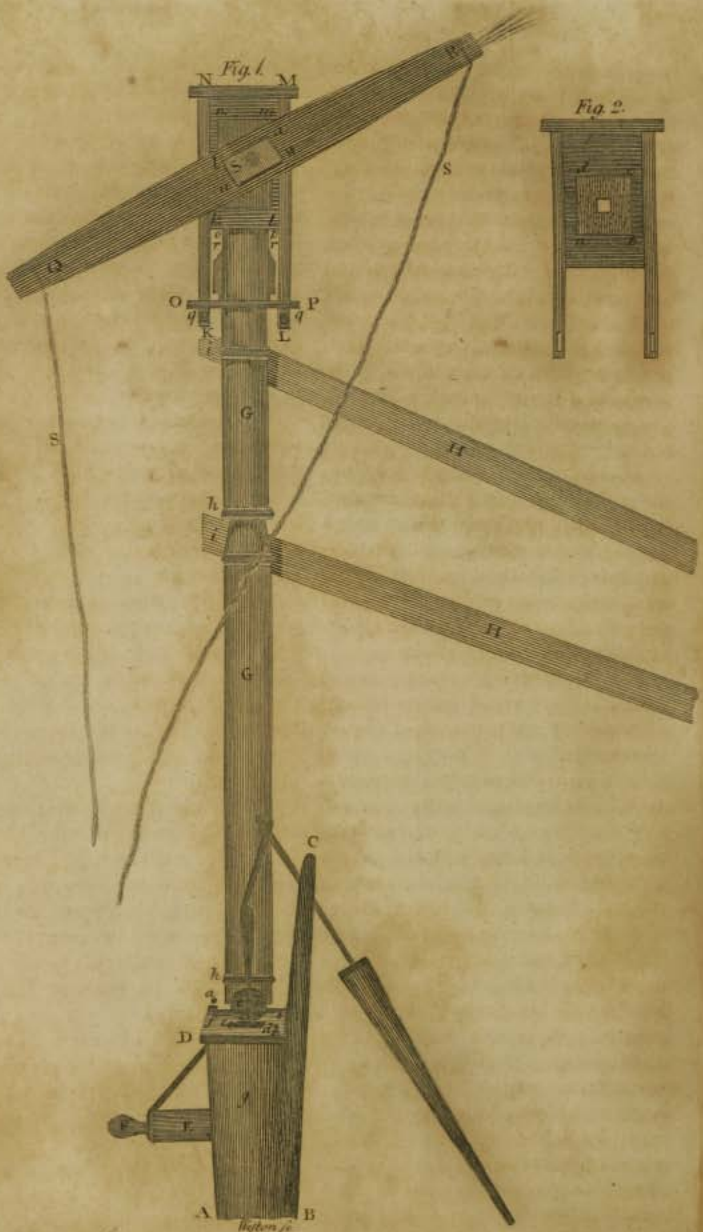
The most powerful agents, however, on the human pulse, are the passions and affections of the mind: thus, under the influence of terror, it is unequal, small, and contracted ; under that of joy, it becomes frequent and large ; during anger, it is hard, and beats quickly ; and lastly, in persons pursuing intense study, it is unusually languid.

According to our experience, the standard of a natural pulse in adults, in a good state of health, appears to be 72 in men, and 66 in women ; though Dr. Falconer fixes it, in general, at 75 in a minute, and its extreme acceleration at 125. Thus, we observe from the computation exhibited in the table, that, for a person whose natural pulse is 75, the beginning of fever is put down at 96 ; hectic fever at 108 ; and inflammatory fever at 120.... According to this proportion, in one whose natural pulse is 60, the first of these stages should be about 77 ; the second, 86; the third, 96. On the other hand, a natural pulse of 80, would require them to be about 102, 115, and 128.

Independently of other symptoms, neither the *frequency* of the pulse, nor its peculiar modification, appears to be of so much consequence in diseases, as is generally imagined. Formerly, the *urine* was chiefly consulted ; but, in modern times, the quacks have usurped that criterion ; and physicians of great practice seem to pay particular attention to the *pulse ;* as their time is equally short and valuable. See Physician.

PULSE, in botany, a term applicable to all grains or seeds that are gathered with the hand ; being opposed to corn, &c. which are reaped or mown. It is more particularly employed to denote the seed of *leguminous vegetables*, such as pease, beans, lentils, vetches, &c.; respecting the culture of which, the reader will find an account under those respective articles.

All pulse contains a large portion of fixed air, and also of crude indigestable particles : if eaten too frequently, or in immoderate quantities, leguminous vegetables are apt to produce flatulency and costiveness : for, as such earthy particles cannot assimilate with the human fluids, they often remain in the body indigested, for a considerable length of time, to the consequent injury of the alimen-



American Pump Engine

tary canal. Hence, persons of relaxed habits ought to eat them sparingly, and, in preparing *pease-soup*, to boil the pease undivided; by which simple expedient they may avoid the oppression of the bowels, and the heart-burn; which are generally occasioned, when these pulse are split, and deprived of their husks.

PUMICE-STONE, a hard fossil, that is frequently ejected from volcanoes: it is very light, with numerous pores, being of a white, grey, reddish-brown, or black colour.

This mineral is usefully employed in different mechanical trades, for rubbing, and smoothing or polishing wood, paste-board, metals, and stone; because, on account of its peculiar roughness and brittleness, it effectually removes all inequalities from their surfaces.

PUMP, a well-known hydraulic machine, employed for the raising of water by the pressure of the atmosphere.

The utility of pumps, in domestic life, being universally acknowledged, various contrivances have been proposed and adopted with a view to facilitate the drawing of water. Among the latest inventions, the *American Pump Engine* deserves particular notice. This machinery was contrived by Mr. Benjamin Dearborn, and is so constructed, that it may be conveniently added to a common pump, in order to answer the purposes of a *Fire-Engine*....We have, therefore, furnished our readers with a plate, from the *Memoirs of the American Academy of Arts and Sciences*, of which the following is an accurate description:

Fig. 1. A, B, C, D, represents a pump, the form of which is similar to that of the pumps commonly employed on ship-board.

E, the spout.

F, a stopper.

D, *d*, a plank-cap, that is fitted to the pump, and provided with leather on its lower surface; being secured by the screws, *a*, *b*: in the centre is a hole, through which the spear of the pump passes, and round which a leather collar is made, as represented at the letter *c*.

g, a nut for the screw *b*.

f, a square piece of wood, that is nailed across one end of the plank-cap, through both which the screw *a* is introduced: a hole is made through such piece and the cap, that communicates with the bore of the pump.

G, G, a wooden tube, which may be of any requisite length, and consist of any number of joints: it is made square at the lower extremity, and perforated for the reception of the cock; the upper end being made with a *nice* shoulder.

e, a wooden cock, that opens or shuts the communication between the pump and the tube; being furnished on the opposite side with a handle and with a lock, in case it should be found necessary.

h, *h*, are two ferules, the object of which is to prevent the tube from splitting.

H, H, braces, each of which ought to be crossed over another, as nearly at right angles as possible.

i, *i*, are irons in the form of a staple, which surround the tube, and pass through the braces; their ends being perforated with holes for fore-locks.

K, L, M, N, is a head, made of five pieces of wood; *k*, *l*, *m*, *n*,

a square piece, in the lower part of which is a hole for the reception of the extremity of the tube, and which piece rests on the shoulder *o*, *p*; to the lower end of this head is nailed a piece of leather, with a hole in its centre, similar to that made in the wood. Another piece of leather of the same form is placed on the top of the tube, and between both is a circle of thin *plate-brass*; the two pieces of leather and the brass being pressed between the lower end of the head and the shoulder of the tube...., Their edges are delineated at *o*, *p*.

K, N, and L, M, are the edges of two pieces of plank, of a similar width with the head, to which they are closely nailed; each being provided with a tennon, that passes through a mortice in the end of the piece O, P: both tennons have holes for a forelock at *q*.

O, P, a piece of plank, of the same width as the sides; the centre of which is perforated, in order that the tube may pass through; and in each end of which is a mortice for the reception of the tennons.

N, M, a cap.

r, *r*, are two pieces nailed to the side of the tube; the lower extremity of each is provided with a *truck*, with a view to lessen the friction of the head in its horizontal revolution.

q, *q*, represent forelocks, the design of which is to fasten down the head, and prevent the water from escaping at the joint *o*, *p*.

Q, R, is a wooden conductor; the extremity marked with the letter Q, being solid, while the opposite end, R, is bored with a small auger.

s, a bolt, that passes through the conductor and head, being secured on the back with a forelock, or nut: this bolt is rounded near the head, and square in the middle.

t, *u*, *w*, *x*, represents a piece of iron or brass, designed to prevent the head of the bolt from wearing into the wood.

S, S, are ropes for the direction of the conductor.

Fig. 2. Represents the head without such conductor.

a, *b*, *c*, *d*, is a thick brass plate, the centre of which is perforated, so as to admit a passage to impurities, that might otherwise obstruct the conductor: for which purpose a piece of leather is nailed under it to the head. The square hole in the centre is adapted to the size of the bolt, which it prevents from turning. The conductor has a hollow cut round the bolt on the inside, of the same size as the circle of holes in the brass: round such cavity is nailed, on the face of the conductor, a piece of leather, that plays on the margin of the brass-plate, when the conductor is in motion.

In the conclusion of his Memoir, Mr. Dearborn observes, that he has raised a tube of 30 feet on his pump; and, though the severity of the season had prevented him from completing it, so that one person only could work at the brake; yet he is enabled to throw water on a contiguous building the nearest part of which is 37 feet from the pump, and between 30 and 40 feet in height.

Numerous patents have been granted for inventions or improvements in the construction of pumps; of which the following deserve to be mentioned: name-

ly, Mr. NOBLE'S, obtained in 1784; Mr. SKEY'S in 1785; Mr. FULTON'S in 1788: and Mr. BUCHANAN'S in 1796;....as, however, the specification of such patents, would occupy more room than our limits will permit, the curious reader will consult the earlier vols. of the *Repertory of Arts*, &c.; where they are detailed, and illustrated with engravings.

PUNCHEON, a vessel of capacity for measuring liquids; it is chiefly employed for the conveyance of rum from the colonies, and contains 130 gallons, according to the wine-measure.

PUNCTURE, in farriery, a species of wound to which the feet of horses are much exposed; and which has received this name from the minuteness of the orifice; the injured parts closing up easily, so that it becomes difficult to ascertain the real depth of the wound.

Punctures are gennerally occasioned by the animals treading on sharp stones, broken glass, or other pointed substances, and not unfrequently from nails, when applied by clumsy farriers; in consequence of which, the sole or frog is perforated; the interior parts of the feet are wounded, and become highly inflamed....If timely detected, punctures may be easily cured, by opening a passage for the discharge of the collected matter; after which, it will be proper to keep the foot moist by the application of emollient poultices round the hoof. Should, however, any fragments of glass, nails, &c. remain in the wound, the inflammation will increase, and at length the tumor will suppurate. The matter then accumulates; and, from the natural shape of the hoof, finding no outlet downwards, it ascends up to the coronet, where it forms a round tumor, that afterwards breaks out into a malignant ulcer called a QUITTOR-BONE; under which article we propose to state the most appropriate remedies to be adopted in such cases.

PUNISHMENT, or the penalty which a person incurs on the commission of a crime, or trespass.

[By the laws of the U. States there are no less than *fourteen* offences for which a convict may suffer the *ultimam poenam legis*.... the highest punishment which society can inflict.

1. Treason.

2. Murder in an arsenal, fort or other places within the exclusive jurisdiction of the United States.

3. Murder at sea, or in a river, bay, &c.

4. Robbery....at sea, &c.

5. A master or mariner's piratically running away with a vessel or with merchandize to the value of 50 dollars, or yielding up such vessel or merchandize to a pirate.

6. A seaman's laying violent hands on his commander, to prevent his fighting his ship.

7. Any citizen, committing piracy or robbery, under colour of a commission from some foreign power.

8. *Accessories* to murder, piracy, &c.

9. Forgery of certificates of public debt, &c.

10. Rescue of persons convicted of capital offences.

11. Robbery of the Mail, (on conviction of a second offence.)

12. Debasing the public coin ....or,

13. Embezzling any metals sent to the mint of the United States for coinage.....and finally,

14. Murdering an Indian or Indians, in amity with the United States.]

Purging of Horses. See HORSE MEDICINES, vol. iii.

PUTREFACTION, is one of the natural processes, by which all organized bodies are dissolved, and reduced into what may be termed their *original elements.*

The bodies, most liable to putrefaction, are vegetables and animals, especially those abounding with juices; but, if the latter be exhaled, or otherwise extracted, the former may be preserved for almost any length of time. The corruption of such substances may also be prevented by the addition of other matters, that tend either to harden the texture of the body, or to effect an entire decomposition of parts; in consequence of which, they are converted into a state resembling that which results from spontaneous putrefaction; so that this process cannot commence. Thus, various kinds of salt, acids, and ardent spirits, indurate the flesh of animals; and are therefore advantageously employed for its preservation. Oils and gums operate in a similar manner; as they exclude the air, which is in some degree essential to complete the process of putrefaction.....See ANTISEPTICS.

In February, 1793, a patent was granted to the late Mr. JOHN DONALDSON, for a new method of preserving animal and vegetable substances from putrefaction. His *preservative* is composed of wheat or barley-meal, and a solution of any common gum or vegetable mucilage. These ingredients are made into a paste, which is to be baked in the moderate heat of an oven, contrived for that purpose; so as to prevent it from either burning or forming a crust: the dry mass is again reduced to a powder, which is now fit for use. The flesh, vegetables, &c, may be either raw, or dressed in such manner as may be found necessary: they are to be packed in wooden boxes, surrounded with the powder, and secluded from the external air....By this method, it is stated, both animal and vegetable matters may be kept free from corruption, for an indefinite period of time.

[PYROLA, *Winter-Berry.* A genus of plants comprehending six species, all of which are natives of the United States. The *P. Maculata* is exclusively a native of our country.

The *P. Umbellata*, or *pipsissiseua*, has been specially treated on by Dr. J. J. MITCHELL, in his *Inaugural Dissertation, Philadelphia*, 1803, by whom a variety of experiments were made, to ascertain its virtues. It is astringent, and nearly allied to the *arbutus uva ursi* or bear-berry. It was used with success, during our revolutionary war in Htyphus. The application of a decoction of the plant joined with vinegar speedily removed the blackness, arising from a bruise. The bruised leaves moistened with brandy, and applied to the skin, produced blisters. The Indians use the *P. Rotundifolia*, for the same purpose.]

Q.

QUACKERY, or *Empiricism*, a term of extensive signification; as it relates to all those who pretend to medical knowledge and skill in the exercise of the healing art; though they act upon mere principles of slavish imitation, and the shallow inference drawn from single instances.

If the object with which medicines are administered be duly weighed; and the numerous diseases to which the human frame is exposed, be seriously considered; it must excite the greatest astonishment, that no steps are taken to suppress those insidious pretenders, who, like ephemeral insects preying on the cankered tree, exercise their predatory arts on the purse and constitution of mankind; and, that so sordid a practice should not only be tolerated, but even indirectly countenanced by the highest authority, in an enlightened country. It will probably be objected, that abuses so gross and palpable, are connived at only, on account of the revenue they produce to the Treasury; but, is it compatible with sound policy, justice, and humanity, to supply any deficiency of the State, at the expence of all that is most dear to man.....his health? Beside, how often must the moral law be wounded, for the sake of this public sacrifice?....Would any person whose time-piece has received an injury; or whose cattle are attacked with the distemper; or whose dwelling threatens to tumble down, ever think of employing a vagrant in preference to either a professed watch-maker, farrier, or builder? and yet, these considerations are but trivial, when compared to the inestimable value of health! Such impostors generally assume a pompous and mysterious manner; they deal in duplicity of speech and action; *always* engage to cure, while they represent every case as highly dangerous, in order to enhance their own importance; in short, they are equally afraid, and incapable, of giving a reasonable explanation, or candid opinion: let these harpies of the deluded multitude fairly state their successful experiments, not supported by *perjury*; and compare them with the number of unfortunate victims whose credulity led them to a premature grave. Many instances of this melancholy description have come within our knowledge; and

we doubt not but every medical practitioner has cases to produce, where, in consequence of taking quack medicine, his patients were afflicted with inflammation of the bowels; obstructions of the liver, or intestines; and not seldom, with incurable consumption. Humanity can only drop the silent tear of sympathy over the deluded sufferers, while the government alone has the power to suppress and punish these pests of society, and to exercise the same degree of rigorous justice as is shewn to the highway robber and assasin; whose crimes, though apparently more heinous, are less destructive in their influence on society.

QUAIL, the COMMON, or *Tetrao coturnix*, L. Quails resemble the partridge in shape, though they are not half of its size:.... they construct no nest, but a few dry leaves or stalks scraped together, or sometimes a small cavity in the ground serves for their habitation. Here, the female deposits six or seven, and, according to FUNKE, from fifteen to twenty, whitish eggs, marked with irregular rust-coloured spots; and produces but one brood in the year.

The quail is a cleanly bird, never resorting to dirty or wet places; its food is similar to that of partridges. Numbers of the former are taken by means of a net and the *call*, from the month of April till August: the proper times for this sport, are, at sun-rising, at nine o'clock in the morning, at three in the afternoon, and at sun-set; because these are the natural periods of their *calling*. The notes of the cock and hen-quail are very different; and it is remarkable, that the proportion of males, much exceeds that of female birds in these species.

The flesh of quails is considered a great dainty, being more juicy and tender than that of partridges; but, as quails feed on the seeds of darnel, hellebore, and other poisonous plants, the eating of such birds has sometimes been attended with injurious effects. An absurd practice prevails in Italy and China, where quails are trained for *fighting*, in a manner similar to that of *cocks* in England.

QUAKING-GRASS, or *Briza*, L. a genus of plants, consisting of seven species, three of which are indigenous; and the principal of these is the *media*, Common Quaking-grass, Middle Quake-grass, Cow-quakes, or Ladies-hair: it grows in fields and pastures, and flowers in the month of May or June....This species is eaten by cows, sheep and goats. It makes tolerably good hay; and, as it thrives on poor, wet lands, where other grasses will not vegetate, it deserves to be cultivated in marshy situations; though its stalk seldom exceeds twelve inches in height.

QUARANTINE. See LAZARETTO.

QUARTER-EVIL, a disorder which chiefly affects calves, and other young cattle: in Staffordshire, it is termed the *irons*; in Leicestershire, *black-legs*; and in Shropshire, it is called *stricken*.

This malady generally commences with a lameness in one of the legs, attended with a high degree of inflammation; which soon extends to the body, and its principal parts: these become extremely hard, tense, and appear much distended with wind. Sometimes the tension and inflammatory symptoms first appear in the body, the dewlap, or the lower part of the rump; but, in all cases, a total stagnation of the blood and

mortification of the part ensue, in consequence of which the animal dies in a few hours.

Although the quarter-evil is not supposed to be contagious, yet it generally spreads in the same herd; five, six, or seven, out of ten, upon an average, usually fall victims to this dreadful disorder.

In the 14th volume of *Annals of Agriculture*, the following recipe is inserted by R. Proctor Anderson, Esq. who states it to be an effectual preventive of the quarter-evil, if duly administered:..... Take Rue, Lavender-cotton, Common Southern-wood, (*Artemisia Abrotanum*), a few heads of Garlic, and a little Savin, cut very small; add to these ingredients, Flour of Sulphur, Diapente (vol. iii.), Elecampane-Powder, half an ounce of each. Boil the whole in urine; then remove it from the fire, and let it stand till milk-warm. After taking about one quart of blood from each calf, drench the animal with two common bullocks-hornfuls of liquor, prepared as above directed, adding to each a table-spoonful of Barbadoes tar; a little of which he might be induced to lick, by smearing it over his nose, loins, and ribs; an expedient which will promote his recovery.

[The above *farrago* is retained, in consequence of the positive manner in which the prescriber speaks of its efficacy, but judging from the inert quality of some of the ingredients, and knowing how little many of them are calculated to remove the violent inflammation, which is said to attend the complaint, the editor would be very unwilling to try the remedy: he would rather prefer either to bleed the animal, and *largely*, or *not at all*, and if possible, in the affected leg or thigh, and to give smart purgatives of oil and brine.]

QUASSIA, or *Quassia*, L. a genus of trees, consisting of three species the principal of which is the *amara*, or Bitter-Quassia; a native of the West Indies and of South America.

The root, wood, and bark of this tree, are all employed in medicine; but the latter, having a great degree of bitterness, is more efficacious....Quassia possesses no peculiar odour; but its taste is extremely bitter. It is an excellent tonic, antiseptic, and febrifuge: being one of the least heating drugs, it has been found very serviceable in exciting appetite for food; expelling flatulency; assisting digestion; and particularly in removing costiveness, when produced by weakness of the intestines, such as is consequent to sedentary occupations. Dr. Lettsom prescribed it with advantage, in cases of debility after febrile affections; in dyspepsy arising from intoxication, and in diarrhœas; but he directed it with the greatest success, when combined with some absorbent, in the hysteric atony of females. It may be given either in infusion, or in pills composed of the watery extract: the former preparation, however, is generally preferred, in the proportion of three or four drams of the wood, to twelve ounces of water; and which is to be taken in doses of one or two table spoonfuls, frequently repeated.

QUICKEN-TREE, Mountain-Ash, or Roan-tree, *Sorbus aucuparia*, L. (*Pyrus aucuparia* of Dr. Smith), an indigenous shrub growing in woods and hedges; in mountainous and boggy situations; principally in Wales, Scotland, and

the northern parts of England: it flowers in the month of May.

The mountain-ash may be reared either as a shurb, or as a large tree, according to the soil in which it is planted: it flourishes best on the sides of hills, in sheltered situations, and in fertile lands, where it attains a considerable size. It forms part of many ornamental plantations, on account of the beauty of its growth, flowers, and foliage, and particularly of its red berries; which, being produced in great abundance, afford a charming appearance from the end of autumn, till they are devoured by the birds, mice, &c. in the winter. The wood is soft, tough, and durable, being advantageously converted into tables, spokes for wheels, chairs, &c.: the roots are likewise very firm, and are formed into spoons, handles for knives, and similar utensils.

The berries of the mountain-ash, though generally devoured by black-birds and thrushes, may with more advantage be given to cattle, sheep, and especially to poultry, all of which animals eat them eagerly. When infused in water, this fruit makes an acid liquor, resembling perry, that constitutes a principal beverage of the lower orders of the Welch people. In the island of Jura, the juice of the berries is employed as an acid for punch: on distillation, they yield a considerable portion of ardent spirit, which possesses a fine flavour; but, for this purpose, they ought to be previously frozen: we conceive, however, that these berries, when dried and pulverized, might, in times of scarcity, be more beneficially converted into a wholesome bread; though Beckmann informs us, that 12lbs. of such fruit yield three quarts of brandy. In tanning, the branches, leaves, and unripe fruit of this tree, have all been usefully employed, both by Gleditsch and Bautsch.

[The American species of *Sorbus*, is different from the European species. The fruit and compound leaves are smaller, and smooth; they are however very handsomely shaped, and disposed. The cymes of fruit are much larger than the European species, the berries of a fine scarlet colour, and when ripe, make a fine appearance in the autumn, while they continue on the tree, but are soon devoured by birds.

The wood answers very well for hoops, being pliant, tough, and durable. It is called moose-wood in the western country, (where it abounds) from the circumstance of the moose deer feeding on the bark and twigs. Wm. Bartram.]

Quick-in-hand. See Balsamine.

Quick-lime. See Lime.

Quickset. See Hawthorn; Fence; and Hedge.

Quicksilver. See Mercury.

QUILLS, are large feathers plucked from the end of the wings of geese, crows, &c. They are termed *first*, *seconds*, and *thirds*, from the order in which they grow in the wing: the two last, however, are principally employed for writing, on account of the larger size of their barrels.

As the utility and value of quills, in the manufacture of pens, greatly depend on their firmness and elasticity, different expedients have been contrived, with a view to divest them of their natural softness. The most simple of these, consists in thrusting the barrel into hot sand or ashes for a few moments; after which it is pressed almost flat, by

means of a pen-knife, and then rendered round between the fingers, by the assistance of a piece of leather, or wollen cloth ; with which their external roughness may be easily removed by friction. If, however, a considerable number of quills is to be hardened, it will be advisable to set a vessel, containing a little water and alum, over the fire ; as soon as the liquor begins to boil, the barrels only must be immersed for a minute, after which they may be suspended to dry. Good pens constitute an article of indispensable necessity in all departments of trade, commerce, literature, &c. Hence, it becomes an useful, if not important object, to be able to cut them according to the most approved rules. The reader, who is desirous of information on this head, will find some pertinent hints in Mr. WILKES's small tract, entitled, *The Art of Making Pens scientifically*, &c. (small 8vo. 1s. Crosby and Letterman) ; in which plain directions are given to that effect, together with appropriate instructions for the management of the quill, pen-knife, hone, strop, and other articles, connected with the art of *pen-making*.

QUINCE-TREE, the *Pyrus Cydonia* of LINNÆUS, but which is considered by MILLER, and other botanists, as a distinct genus of fruit-trees, under the name of *Cydonia* ; and consists, according to them, of three exotic species, namely :

1. The *oblonga*, or Oblong-Quince, the fruit of which is pear-shaped, and lengthened at the base.

2. The *maliformis*, or Apple-Quince, having oval leaves, which are of a woolly texture on the lower side.

3. The *Lusitanica*, or Portuguese Quince, that has obverse, oval leaves, somewhat woolly on the upper side.

All these species are cultivated in Britain ; though the most valuable is the Portuguese Quince ; the pulp of which, on being stewed or baked, assumes a fine purple colour, and becomes less austere than that of the others. It is propagated by layers, suckers, or cuttings ; but the last method only is calculated to produce the greatest abundance of delicious fruit. The cuttings ought, therefore, to be planted early in autumn ; and, if the weather be dry, it will be advisable to water them frequently, in order to facilitate their striking root. In the second year, they should be removed into the nursery ; and set, at the distance of one foot from each other, in rows three feet apart. In the course of two or three years, they may be transplanted to the place of their ultimate destination, and which should always be contiguous to some river, or the soil at least ought to be moist ; as they will thus produce a greater quantity of large fruit, than if they had been set in dry situations ; though such as are obtained in the latter, possess a finer flavour.

Quince-trees require very little pruning : the most important part of their management consists in clearing their stems from suckers ; and in cutting off such branches as interfere with each other. All luxuriant shoots, that strike upwards from the middle of the tree, must be lopped, lest the head be too much crowded with wood, which might prevent the growth of the fruit. Quince-trees are also highly esteemed, as stocks, on

which pears may with great advantage be grafted, or budded..... This operation greatly improves the taste and flavour of these pears, which arrive at maturity in the summer and autumn ; but it is by no means proper for winter-fruit, which is thus rendered hard and stony. In the colder climates of Europe, Quinces are not eatable in a raw state : nevertheless, they possess antiseptic properties, when dressed, and contain a considerable portion of acid and mucilaginous juice. Though their pulp be somewhat difficult of digestion, they seldom disagree with the weakest stomach. The liquor expressed from them, has frequently been given in small quantities, with great success in nausea, vomiting, and similar complaints..... This fruit is generally boiled and eaten with sugar, in which form it may also be usefully employed in cases of dysentery. One quart of the juice of Quinces mixed with one pound of sugar, and fermented, afford a delicious wine : on adding to the same quantity, one pint of the best French brandy, and four ounces of sugar, a celebrated *liqueur* is prepared on the Continent, and which is greatly prized as a cordial and stomachic, when taken in the small quantity of two or three spoonfuls, before breakfast. By boiling the kernels of quinces in water, a mucilage is extracted, which is often used in medicine as a proper substitute for that of gum-arabic.

QUINSY, or *Sore-Throat*, is an inflammation of the internal parts of the mouth, throat, and windpipe, attended with fever.

As this frequent affection is divided into several species, each of which requires a particular treatment, it will be necessary to state the symptoms, by which they may be distinguished from each other.

The first is the *common sore-throat*, where the glands, or tonsils, situated at the posterior part of the mouth, appear swollen, red, and painful; the deglutition and respiration are difficult ; it occurs in the spring and autumn, when the air is moist, and chiefly attacks the middle-aged, and those of plethoric habits. The event is generally favourable, either by resolution, or suppuration.

The second is an *inflammation of the throat*, at the posterior part of which a redness, though no swelling, is discernable ; the pain is more violent than in the former; deglutition more difficult ; respiration is, however, easier, but accompanied with cough and hoarseness. It likewise terminates in a few days, and in general, without danger.

The third, or *malignant sore-throat*, affects the tonsils and throat with swelling, redness, and mucous crusts of a whiteish or ash-colour, which cover the ulcers : it is attended with a putrid fever, the greater or less violence of which determines the degree of apprehension for the life of the patient. This malady originates in a contagion of the air, similar to the small-pox, and other epidemic diseases.

The fourth is an *inflammation of the windpipe*, when the breathing is difficult ; the inspirations are loud ; the voice is hoarse with a cough, but scarcely any visible swelling in the throat ; deglutition easy ; and the fever is extremely violent. This disorder frequently

attacks children, from the time of weaning till the twelfth year of their age, with this peculiar circumstance, that the inside of the windpipe is lined with a substance, which is apt to obstruct the passage of the air, and thus often proves fatal by sudden suffocation, unless timely relief be procured....See CROUP....A favourable issue, however, may be expected, if an expectoration of a yellow matter streaked with blood, or even a swelling on the side of the neck appear; which last symptom indicates, that the disease will terminate externally.

The two first species require a cooling diet, and diluent drink; such as barley-water with currant-jelly, linseed tea with honey, &c. A large blister applied to the chest, or between the shoulders; and gargles of sage-tea, honey and vinegar, aided by bathing the feet in warm water, will generally be sufficient to procure relief. But, if the swelling continue to increase, leeches should be applied to the outside of the neck; and recourse must be had to other means, in order to promote a suppuration: this may be effected by fumigating the throat through a funnel placed over a vessel of hot-water, into which should be thrown some camphor reduced to a coarse powder. After the disease is removed, care should be taken to avoid a relapse, by keeping the neck warm; though too anxious measures, and cravats too heating, would doubtless lead to the opposite extreme.

The cure of the *ulcerated sore-throat*, depending chiefly on the nature of the fever with which it is attended, requires the aid of a professional man: we shall, therefore, here only point out the regimen to be observed during it course. The diet ought to consist of sago, tapioca, panada with a proper quantity of wine, ripe sub-acid fruit, such as prunes, currants, raspberry-jelly, &c. Negus, perry, cyder, &c. may be allowed for drink; but the patient should always previously use the gargle above directed. His posture in bed ought to be such, that the discharge from the mouth may be facilitated, and the greatest attention must be paid to clean linen and pure air.

In the fourth species of quinsy, blood-letting is the principal remedy: hence, from three to six leeches should be immediately applied to each side of the neck, and a blister to the front; at the same time administering a brisk emetic, to dislodge the membrane which is forming; and by the removal of which, the inflammation often speedily disappears. In this complaint, the patient should be suffered to sleep as little as possible; for no circumstance has a stronger tendency to aggravate the disease. At all events, medical advice ought not to be neglected.

QUITCH-GRASS. See DOG'S-GRASS.

QUITTOR-BONE, in farriery, a malignant tumor which is attended with great pain, inflammation, and a considerable swelling around its basis. It is generally occasioned by long-neglected PUNCTURES (which see), or such as have resisted the usual remedies employed in that affection of horse's feet.

The method of cure commonly practised in the quittor-bone, consists in perforating the tumor with numerous holes, by means of a hot

iron, pointed in a pyramidal form; after which, small pieces of arsenic, or corrosive sublimate, are introduced into the cavities, where they consume, and at length separate, a mass of mortified flesh, termed by farriers, the *core*. This practice however, is extremely dangerous, and does not always effect a cure, so that it becomes necessary to repeat it a second, and even a third time, to the consequent injury of the animal. The most eligible method, therefore, will be a speedy operation; for which purpose, a ligature must first be tied round the fetlock, in order to prevent too great a loss of blood; and then the tumor may be extirpated with a sharp crooked knife.

The wound is now to be dressed with warm *digestive* or *emollient* POULTICES (see HORSE-MEDICINES, volume 3d.) and, when a proper suppuration is effected, the scabby parts may be sprinkled with the following escharotic, namely: Take three ounces of lime, that is reduced to powder on exposure to the air, and one ounce of Armenian bole; let them be pulverized in a mortar, and passed through the sieve. Next, it will be advisable to cover the orifice with a pledget of dry lint; and, when the surface is nearly equal to the skin, the powder alone will be sufficient. Lastly, if the quittor-bone be attended with very acute pain, it will be advisable to resort to the remedies usually employed in inflammatory cases; in order to prevent the humour from flowing to the wounded limb. The animal ought, therefore, to be bled; and a draught, consisting of two ounces of nitre, and a similar quantity of common treacle, dissolved in one quart of water, should be given to him every morning and evening. If the horse, however, be affected with griping pains, or other internal uneasiness, the quantity of water may be increased; or the same portion of nitre may be allowed him in a mash of bran, twice every day, till the inflammatory symptoms disappear.

R.

RABBIT, the COMMON, or *Lepus cuniculus*, L. a well-known animal resembling a hare; though it is smaller, has shorter hind-legs, and its ears are thinly covered with hair: it was originally introduced into Britain from Spain.

Rabbits abound in this country; in a wild state, their fur is of a brown colour; but, when domesticated, they are generally black, white, or pied; and their eyes are transparently red.

These animals are reared either in *warrens* or in *hutches*; in the former state, they are permitted to roam at liberty, where they burrow and breed. The best places for such purpose are sandy hills, or those which consist of a loose soil; but it will be necessary to inclose them either with a stone or sod-wall; and at the same time to bore horizontal cavities for the passage of these quadrupeds, till they have formed their own burrows:....the most proper shrub to be planted in such situations, is the juniper-tree, the leaves of which are eagerly eaten by rabbits, and impart to their flesh a delicate, spicy flavour. As warrens are infested with kites, pole-cats, eagles, and other free-booters, it will be advisable to set traps on the stumps or tops of old trees, or on artificial hillocks of a conical form; in order to catch these depredators, as they usually alight on such places.

If rabbits are designed to be reared in a tame state, the *hutches* must be kept constantly clean; as, otherwise, these creatures will be frequently attacked with diseases. The males, or bucks, should be parted from the *does*, or females, till the latter *kindle*; at which time one of the former may be allowed to six or eight of the latter; and a sufficient quantity of fresh hay should be provided, for the construction of a *bed*, or nest.

The females begin to breed, when about six months old; being very prolific, they bring forth, seven times in the year, from four to eight *conies* at a litter, after a gestation of thirty days; and, in the course of six weeks, the young rabbits are able to seek for their own food. The provision of these animals ought to consist of grass cabbages, carrots, endive, clover-hay, and similar vegetables, which should be given them frequently, in a fresh, though not wet state; and, as soon as the young conies begin to disagree after being wean-

ed, it will be necessary to separate them.

Rabbits are chiefly subject to two disorders, which, if they be not timely attended to, generally prove fatal: 1. The *rot*, which is occasioned by feeding them with too large a proportion of green vegetables, or with such as were gathered before the dew or rain was evaporated. It may, however, be prevented by strict attention to their food, and especially by mixing a certain portion of clover, or other hay, with green or moist plants. 2. A species of *madness*, which may be ascertained by their restlessness; as these animals roll themselves on the floor of their *hutches* in an uncouth manner, and hop about in odd postures. Such distemper generally arises from rank feeding, and may be cured by keeping them *low*, and giving them tare, or spear-thistles, the *Carduus lanceolatus*, L.

The usual modes of catching wild rabbits are, by what is called *purse-nets*, and by ferrets; though they are sometime coursed with small greyhounds, or with spaniels trained up to the sport. Another method consists in *smoking* them out of their burrows, by burning sulphur and orpiment at the entrance. The deleterious fumes of these articles compel the animals to rush into the net spread for their reception; but, as their flesh may thus be rendered unwholesome, and a long time must elapse before other rabbits can be induced to enter the holes, such fetid ingredients ought never to be employed.

The rabbit is one of the most useful quadrupeds reared by mankind: its flesh is tender, and nutritious, and consequently well calculated for the food of convalescents; but they ought to be killed by a large wound in the neck, so that the blood may be speedily discharged; an operation which renders their flesh whiter and more delicate....Their *fur* constitutes a principal article in hat-manufactories; and such part as is unfit for this purpose, may with advantage be employed in the stuffing of beds and bolsters, being little inferior to feathers.

RACK. See ARRACK.

RADISH, or *Raphanus*, L. a genus of plants comprehending eight species, of which the following are the principal:

1. The *Raphanistrum*, WHITE-FLOWERED or JOINTED CHARLOCK, or WILD RADISH, an indigenous annual plant, which abounds in corn-fields, and flowers in the months of June and July. It is eaten by horses, but refused by cows. This species is a troublesome weed, and should be carefully extirpated, before it runs to seed: it vegetates with great luxuriance, during wet seasons, amongst barley; and has, in Sweden, occasioned violent convulsive affections in those who ate bread made of that grain.

2. The *sativus*, COMMON, or GARDEN RADISH, is an exotic species, originally from China, and which is cultivated for the table. There are several varieties of it, known under the names of the small-topped, deep-red, pale-red, or salmon, and the long-topped striped Radishes; all of which are annual plants; but the *small-topped* is generally preferred in the vicinity of London, on account of the little room which it occupies in the ground.

All these varieties are propagat-

ed from seed, which is sown at various times, from Christmas till May, to ensure a succession of radishes for the table; because they attain to perfection in the course of three months. The earlier crops ought to be sown in warm borders, sheltered from the severity of the winter; but, for the later ones, a moist soil, and an open situation, should be selected.

Radishes are esteemed aperient, attenuating, and anti-scorbutic:.... when eaten in moderate quantities, they are in a certain measure salubrious to persons of strong habits; but are, in general, apt to produce a considerable degree of flatulency in those, whose stomachs are relaxed. The small-topped salad-radishes are greatly superior to the large root: as they are more easy of digestion, and tend to improve the appetite. No radishes, however, ought to be eaten when *old*, or after having been kept for some time; as they are then utterly indigestible, and render the breath extremely offensive.

RADISH, the Horse. See HORSE-RADISH.

RAGS. See MANURE.

RAG-STONE, a genus of siliceous fossils, discovered in various parts of Britain. It is of a greyish colour; contains a large proportion of particles resembling *talc*; and splits easily into thin scales. It effervesces with acids; and, though very soft, emits fire, when stricken against steel. This mineral is employed by artificers for the purpose of giving a fine edge to knives, chissels, and other tools, which have previously been sharpened upon stones of a coarser texture.

RAGWORT, the COMMON, GROUNDSEL, SEGGRAM, or ST. JAMES' WORT; *Senecio Jacobæa*, L. a native perennial plant, growing in meadows, pastures, and on road-sides; and flowering from July to August.

Where this troublesome weed abounds, it is with great difficulty extirpated. The best method hitherto discovered, appears to be either that of plucking it up by the roots, after the ground has been moistened with showers; or *folding it closely* with sheep in the winter season; so that the heavy rains may contribute to its destruction. If the former plan be adopted, it is recommended to pile up the plants thus pulled and cleansed from earth; to burn them; and scatter the ashes on the ground; or, if this cannot be conveniently done, to leave them to rot on, and manure the soil; as the rankness and stench of this weed prove it to be possessed of saline and fertilizing properties. Farther, it is said to be more pernicious in meadow, than in pasture land; for, in the latter it only tends to exhaust the soil; while, in the former, it communicates to good hay a disagreeable effluvia, and deprives it of its sweet flavour.

If gathered before the flowers expand, and employed in a fresh state, the ragwort imparts to wool a fine green, though not permanent colour. But, if woollen cloth be previously boiled in alum-water, and then in a decoction of these flowers, a beautiful deep yellow shade will be produced. DAMBOURNEY states, that, by a decoction of the flowers and stalks while in blossom, the wool previously steeped in a solution of bismuth, acquired a very permanent olive-brown colour, displaying a beautiful golden shade.....When young,

horses and cows eat this weed; but, after attaining its full size, when the stems are a yard high, it is refused by every species of cattle.

RAILS, are pieces of timber, placed on stair-cases, and also on balusters, both as a support, and to prevent accidents. They also denote those pieces of wood which are fixed within pales, in order to strengthen fences.

In April, 1782, a patent was granted to Mr. FRANCIS UNDERWOOD, for his invention of making and ornamenting every kind of railing, balustrades, or balusters, and pannels for stair-cases, galleries, balconies, &c. both in private houses, and in churches, or other public buildings. His privilege is now expired; but, as a detail of the principles on which he proceeded, would be intelligible only to architects, the curious reader will consult the seventh volume of the *Repertory of Arts and Manufactures*, where a full specification is inserted.

RAIN, a well-known meteor, which descends from the clouds in drops of water.

Various conjectures have been formed by natural philosophers, to account for the origin of rain: it appears, however, to be universally allowed, that such phenomenon is produced from the moisture or water which is absorbed from the surface of the globe by the heat of the sun, and conveyed into the atmosphere, whence it is again precipitated upon the earth; though the specific cause is by no means clearly determined....According to chemical principles, the air itself is a *solvent* of water, and thus contributes to the formation of rain in the clouds, when they are saturated with aqueous humours. Now, as soon as two such volumes of condensed vapour meet each other in the atmosphere, in *different temperatures*, the necessary consequence will be *precipitation*; in a manner similar to that from the vaulted ceiling or window of a cold room, when first heated.

Rain irrigates and softens the earth, thus adapting it to the nourishment of plants....By falling on lofty mountains, and other elevated situations, this meteor carries down numerous loose particles of earth into the contiguous vallies, which are thereby not only ameliorated, or rendered more fertile; but the air is also purified from noxious exhalations, which are returned to the ground whence they were absorbed; a natural process that remarkably contributes to enrich the soil. Lastly, it moderates the temperature of the air, and affords a supply of water to fountains, brooks, rivers, &c.

But, though gentle showers be in many respects beneficial to mankind, yet vehement rains coming down in torrents occasion great injury; as they are often attended with violent inundations, which wash or carry off the finer particles into rivers, and thus impoverish the land. To remedy, in some degree, this inconvenience, it has been recommended to plant along their banks, orchards, or groves of trees, that produce esculent fruit; for, according to practical observers, such trees bear greater abundance in wet, than in dry seasons. As, however, all kinds of grain are liable to be materially damaged by storms of rain, especially after being cut, some agriculturists have advised the erection of barns at convenient

distances, on large farms; where corn, &c. may be speedily housed, preserved, and much time, as well as labour, saved in the carriage: but, as these buildings would be exposed to the depredations of dishonest persons, it has farther been recommended to build, contiguously to such barns, cottages to be inhabited by the labourers employed on the farm; by which expedient the grain will be effectually secured, both from the injuries of the weather, and from the attacks of midnight plunderers.

RAISINS, are grapes which have been suffered to remain on the vine, till they have attained to maturity; when they are either dried in an oven, or the fruit being tied together in clusters, and dipped in a ley of wood-ashes, containing a small portion of sweet-oil, is then dried by exposure to the sun, without being separated from the branches:....the latter method appears to be preferable.

The best fruits of this description, are those known under the name of *sun*, and *jar-raisins*; both of which are dried in the sun; being imported from the southern countries of Europe, and also from the Asiatic provinces of Turkey. They form a principal article of the dessert; and, when properly managed, yield an agreeable *wine*. For this purpose, let one cwt. of raisins be deprived of their stalks, chopped, and put into a wide, but not too deep vessel. Two-thirds, or fourteen gallons of water, are now to be added, and the whole suffered to stand for fifteen days, being carefully stirred once every day. At the end of that period, the raisins must be strained, pressed, and the liquor obtained from them, poured into another vessel. The remaining third part, or seven gallons of water, should next be added to the fruit, thus pressed, and likewise stand for the space of one week. The liquor is then again to be strained, and the two *runnings* are to be poured into a barrel, capable of containing twenty-one gallons, together with a quart of brandy. In order to colour the wine, three quarters of a pound of refined sugar must be set on fire, and burnt into a little of the liquor, which ought to be added to the whole; and, as soon as the fermentation ceases, the barrel may be closed, and suffered to stand till its contents are ready for bottling.....*Raisin-wine* is an agreeable, cooling liquor; but, if it be too often used, or in too large quantities, it is apt to occasion flatulency.

With respect to their properties, raisins are too frequently relished as an article of food, to be considered as a medicine. They are very nutritive, and have been recommended in *nephritic* complaints (See KIDNIES); but if eaten immoderately, they contribute to the decay of the teeth, and occasion painful colics. Raisins are likewise used in pectoral decoctions, and similar medicinal preparations; for which purposes the stones ought to be carefully taken out; and also in all cases, where their astringency is not required.

RAM, the male of a sheep.

As we propose to treat of the proper management of SHEEP, in that article, we shall at present only state the general marks that should characterize the appearance of a *good* ram, which is intended for the purpose of breeding. Such an animal ought to be large and well-proportioned; his head should be thick and strong, with a broad

front; the eyes and nose black; the neck thick; the body long and tall; and the tail of considerable length.

Rams are capable of propagating at the age of eighteen months: and, as the fine quality of the wool depends greatly upon the judgment of the breeder, it has been recommended to take the advice of some experienced clothier, or wool-stapler; who, being accustomed to investigate wool, will be able to decide with the greatest accuracy, and also with a view to the breeder's *real* profit. The coat must likewise be minutely examined, lest it be *stitchy-haired;* for, in such case, the wool will be so materially damaged in the course of two years, that the loss cannot be recovered, without changing the whole flock, in the space of twelve or fourteen years.

Beauty of shape, and fineness of wool, however, are not the only distinguishing marks: it will, farther be necessary to reject the animal, in case he have not a *close thick coat* along his back, and in which there is *plenty of yolk;* as otherwise it may be assumed for certain, that he is not in perfect health.

With respect to the purchasing of rams, circumspect breeders advise to procure them a short time before they are shorn, and from the *farmer's, grazier's,* or *owner's house;* because the animals may then be seen in their *natural state*, without the possibility of any fraud or imposition by the vender: besides, the depth or length of the *staple* may then be easily ascertained. It is, however, by no means agreed as to the proper age for purchasing rams; and many practical writers are of opinion, that *crossing the breed* is attended with little advantage: hence, they do not approve of selecting them from distant places. If the farm consist of *down-land*, it will, on their principles, be advisable to purchase animals bred on a similar soil; if it be inclosed, they should be bought off such land as is not commonable; but, in all cases, it will be proper to obtain them from an inferior soil; for they will then thrive in the new possessor's keeping; whereas, if a contrary plan be pursued, the rams will diminish in fatness, and become less healthy.

[RANSTEAD. See FLAX (toad).

RANUNCULUS. A genus of plants comprehending several species, some of which are natives of the United States.

1. The *R. sceleratus*, or celery-leaved crow-foot, is a very acrid plant. Bruised and applied to the skin, it will blister in a few hours.

2. The *R. bulbosus*, or buttercups, was noticed under the head *Crow-foot*, as a troublesome weed, of which possesses the same properties.]

RAPE, or COLESEED, *Brassica Napus*, L.] a valuable indigenous plant, of the uses of which we have already given a concise account, vol. i. p. 466:....we shall, therefore, add a few particulars relative to its culture, &c. to render our statement more complete.

This plant is cultivated principally for the purpose of expressing the oil from its seed, by which it is also propagated:....the best kind of the latter should be large and black; it ought to be sown in the month of June (in the proportion of 2 lbs. per acre, broad-cast), with the two fore-fingers and thumb, to prevent it from shooting up in *patches:* it may likewise be drilled, at the dis-

tance of 12 or 14 inches apart..... Sometimes rape and turnips are sown together; but such practice is not economical; as the two crops mutually injure each other.

Rape yields most abundantly after beans, turnips, or cabbages; the soil being previously ploughed twice, *north and south*, for the better reception of the solar heat; and, if transplanted, such plants will vegetate with uncommon luxuriance, so as amply to repay the additional expence. For this purpose, Mr. HAZARD (*Letters and Papers of the Bath and West of England Society*, &c. vol. iv.) recommends one rood to be sown in the middle of June, and to remove the young plants towards the middle of August, into ridges two feet apart, and at the distance of sixteen inches from each other. As soon as they have taken root, and begin to shoot up, it will be necessary to manage them by the horse or hand-hoe; and to draw the earth around their stems. A rood of land, thus sown, will, according to his experience, produce a sufficient number of plants for the stocking of *ten* acres; and in the following spring the leaves may be fed off with sheep; because new ones will immediately succeed. But, as these tender plants are much infested by slugs, which devour them with avidity, it will be advisable to scatter over them a mixture of slaked lime and wood-ashes, in the proportion of 10 bushels of the former to 15 of the latter, per acre.

Rape-seed attains to maturity from July to September; and, as it is easily shed, the plants are generally cut with sickles; laid on the ground to dry; and the seed is rubbed out on a large cloth spread in the middle of the field, whence it is conveyed to the mill. The oil which these seeds yield by expression, is employed for various useful purposes in domestic life, and particularly for burning in lamps; but, as it is apt to become rancid, M. THENARD has published the following practical method of *purifying* it. He directs $1\frac{1}{2}$ or 2 parts of concentrated sulphuric acid to be added to 100 parts of oil, and the whole to be perfectly incorporated by agitation: the fluid immediately becomes turbid, assuming a dark-green cast; and, in the course of three quarters of an hour, the colouring particles begin to collect in lumps. The agitation must now cease: and double the weight of oil of vitriol, diluted with pure water, should be added: ...in order to mingle these different ingredients, the stirring ought to be renewed for the space of half an hour; after which the whole may be left to settle for seven or eight days. At the end of that time, the oil will be found on the surface; on being gently drawn off, and filtered through cotton or wool, it will be almost entirely divested of colour, smell, and taste; so that it will burn clear, without any interruption.

The refuse of rape, after expressing the oil, is known by the name of *rape-cake*; the economical uses of which we have already stated, vol. i. p. 466....The whole plant is of great service in feeding cattle; and, after the seed is threshed, the straw and chaff, on being burnt, afford ashes equally valuable as the best pot-ashes.

Lastly, if *rape-straw* be strong, it may be advantageously employed for inclosing fences in farm-yards;

and, with still greater profit, for littering straw-yards, cow-sheds, or other receptacles for *stall-fed* cattle.

RASH-BERRIES. See Great BILBERRY.

RASPBERRY, the COMMON, BRAMBLE, FRAMBOISE HIND-BERRY, or RASPIS; *Rubus Ideaus*, L. an indigenous plant growing in damp woods and hedges; in thickets, and gravelly places near rivulets: it flowers in the months of May and June. The fruit of this shrub, in a natural state, is fragrant, sub-acid, cooling, and very grateful: when used as an ingredient in sweet-meats, or fermented with sugar, and converted into wine, or vinegar, its flavour is greatly improved. The white berries are sweeter than the red, but they are generally more contaminated by insects. When eaten in any quantity, and occasionally held in the mouth, this fruit is said to dissolve tartarous concretions formed on the teeth; though, for such purpose, it is supposed to be inferior to *Strawberries*. The young and fresh leaves of the Common Raspberry are eagerly eaten by kids.

By cultivating this shrub for *espaliers*, the size and flavour of its fruit is susceptible of great improvement. BECHSTEIN, therefore, prefers the rearing of it from seed, which affords finer berries than may be obtained, either by setting divided roots, or cuttings. With such intention, we can, from experience, state the following exotic species, as being eminently adapted to the purpose:

1. The *Rubus occidentalis*, L. or Virginian Raspberry-bush, with a prickly stem: its fruit is white, black, sometimes dark-red, uncommonly delicious, but smaller than that of the indigenous species: it thrives in the open air of our climate.

2. The *Rubus odoratus*, L. or Sweet-scented Raspberry, with a plain stalk, bearing many rose-coloured flowers, and numerous palmated leaves. It attains the height of eight feet, and forms a spreading shrub, with close foliage. Its bright-red berries are of a peculiar flat shape, and have an agreeable sub-acid, vinous taste.

3. The *Rubus arcticus*, or Northern Raspberry, a native of the damp regions of Sweden, Russia, and Canada. The berry of this remarkable shrub is dark-red: it excels in taste and flavour all the indigenous fruit of Europe. From its rich, saccharine juice, the natives of those countries prepare a most delicious wine: the berries are also preserved in sugar, or dried, and in that state exported to distant climates.

RAT, or *Mus*, L. a genus of quadrupeds, comprising 60 species, of which the following are the principal:

1. The *decumanus*, Brown or Water Rat, which is a native of the East Indies. These creatures are so fierce and intrepid, that they will even resist, and bite their pursuers, inflicting dangerous wounds, which are attended with great inflammation, and not easily healed.

2. The *rattus*, Black or Common Rat, is a native of Europe, and Asia.

On account of the extensive damage occasioned by both these predatory species, various methods of extripating them are practised, with greater or less success. Dogs, cats, ferrets, and weazels, are their natural enemies; and, though such

useful animals destroy great numbers, yet the killing or taking of rats furnishes employment to many skilful men, who pursue different ways of catching them; and who are known under the name of *Ratcatchers*.

Rats are often caught in traps baited with burnt leather, or toasted cheese; but a more efficacious method of destroying them, consists in mixing a quart of oatmeal with six drops of oil of rhodium, one grain of musk, and two or three fruits of the *nux vomica* finely pulverized; and forming the whole into *pellets*, which must be placed near their holes. This recipe was first published in the *Letters of the Bath Society*, where it is observed, that the rats ate eagerly at first, and that great numbers were killed; but, after a short time, they declined to devour it. Hence, a more alluring substitute was recommended, namely, three parts oatmeal, and one of staves-acre, made into a paste with honey, which should be divided into small pieces, and laid at the entrance of their avenues.

Another composition has been made of wheaten flour, sugar, and water, kneaded into a paste, and scented with a few drops of oil of caraway-seeds: small portions are to be exposed at stated times near their holes, till the animals, lulled into security, collect in considerable numbers. It will then be advisable to incorporate a sufficient quantity of arsenic, finely levigated, with the paste, and thus to render it a fatal poison for mice and rats.

Toward the close of the year 1800. Mr. CUNDELL obtained a patent for a new compound invented by him, with a view to destroy rats. He directs eight ounces of calomel to be mixed with fourteen ounces of dried and pulverized *solanum* (night-shade); fifty-six pounds of oatmeal: six pounds of molasses, and a sufficient quantity of oil of rhodium, to communicate a fragrant smell: the whole is to be formed into a mass with sweet oil.

Besides these remedies, there are many other contrivances for exterminating rats: and, as the subject is of considerable importance to every house-keeper, we shall subjoin an account of several other means, which have been found remarkably successful.

Mr. CHARLES TAYLOR, *Secretary to the Society for the Encouragement of Arts, &c.* directs one or two table-spoonfuls of dry oatmeal to be uniformly, but thinly, spread on a tile or plate, in order that the quantity taken away may be more easily ascertained. The rats, if not interrupted, will regularly feed there; and they must be supplied for two or three successive days with fresh meal, when three drops of oil of aniseed are to be mixed with a double portion of oatmeal; and the composition deposited at the usual place, for a similar period of time. On the fourth day, one half only of the usual quantity must be given of the scented preparation, and on the succeeding night, the following mixture must be placed at the hole: Let four ounces of dry oatmeal, perfumed with six drops of the oil of aniseed, be thoroughly incorporated with half an ounce of carbonated barytes (aerated heavy spar of Derbyshire), which has been previously pulverized, and sifted through fine cambric or muslin. This compound must be spread on

the tile or slate, and exposed as usual, all the doors, or other communications, being shut for the space of 24 hours, that the vermin may eat it undisturbed by any cats, dogs, or other animals; and also to prevent the possibility of any accident happening to the latter.... In the course of a few hours, after the rats have eaten the composition, they will be seen frequently to reel about, as if they were intoxicated, or paralytic; though, at length, they return to their haunts, and perish. Mr. TAYLOR observes that, as they are very cunning, the mixture ought to be left for 48 hours, in case a small portion only be eaten; after which time the remainder should be burnt.

Mr. FUNKE, in his valuable Natural History, calculated for German Schools, communicates the following curious method of expelling, or rather dispersing, rats from dwelling-houses:.....Take one or more of these predatory creatures caught alive in a trap, and immerse them to the neck in a mixture consisting of equal quantities of tar and train oil: thus anointed, set the animals at liberty. The offensive smell of this preparation compells them to traverse all the holes of their companions with the most distressing anxiety; in consequence of which they collectively disappear.....Another expedient practised in Germany, is that of confining a live rat in a cage, and feeding it exclusively with living mice or rats. Having been for some time accustomed to such food, the captive animal is, after a short fasting, suffered to return to its former habitation, where it is said to persecute, and indiscriminately devour its own species.

M. GASCHITZ, one of the most esteemed German writers on economy, states the following to be an effectual remedy for destroying not only *moles* and *mice*, but also *rats* infesting orchards, and injuring the roots of fruit-trees:.....Boil a number of fresh walnuts divested of their external green rind, for an hour and half in water; to which a large handful of hemlock leaves has previously been added. As all these vermin are extremely fond of such nuts, place one of the latter thus prepared within the cavity of every mole-hill. Those which partake of this envenomed fruit, must inevitably perish. The same author advises gardeners to plant a single clove of garlic near every tree; in consequence of which simple practice, neither mice nor rats will approach it. He observes, that the strong odour of this bulbous root is probably offensive to their organs of breathing; and, whatever be the cause, he pledges himself for the success of the experiment.

In Sweden, the green branches of the Bird-Cherry (*Prunus Padus*, L.) are successfully employed for the dispersion of *rats*, *moles*, and *bugs*, when placed in the corners of granaries, stables, dwelling-houses, and mole-hills; but it will be necessary to re-place the dry sprigs, once a week, or fortnight, with fresh branches.

Among other remedies, we recommend that commonly employed on the Continent, where a sponge is fried with salt-butter in a pan; then compressed between two plates; and cut into small pieces, which are scattered about the holes frequented by *rats* and *mice*. This preparation is devoured with avidity; it excites thirst in the animals, which should be

gratified, by exposing shallow vessels containing water. On drinking this fluid, after having swallowed the burnt sponge, it distends their stomach, and proves a fatal repast.

M. *v. d.* HORST, a landed proprietor in Germany, has lately announced in one of the public journals, that a *peacock* kept in a poultry-yard, or about the premises of a dwelling-house infested with rats and mice, is an excellent scarecrow against such free-booters: nay, he remarks, that even a *cock* of an early spring-brood, has so shrill and penetrating a voice, as to answer the same purpose. With regard to the former bird, he appeals to his own experience, which has furnished him with satisfactory proofs of success.

Lastly, as most of the methods before suggested, are either troublesome and precarious, or only partial means of exterminating the object of our research, we shall conclude with a more general and summary process of entrapping rats, so as to deliver not only our own habitations, but those of our neighbours, from the incursions of such mischievous quadrupeds. For the discovery of the following *complete* remedy, we are indebted to G. W. MILLER, an ingenious apothecary of Wernigerode, in Germany: he candidly acknowledges to have derived the first hint for such purpose, many years since, from a book written by a celebrated economist; in short, it will be found the most expeditious and effectual mode that can be pursued. A capacious cask of moderate height must previously be procured, and put in the vicinity of places infested with rats. During the first week, this vessel is employed only to allure the rats to visit the solid top of the cask, by means of boards or planks arranged in a sloping direction to the floor, which are every day strewed with oatmeal, or any other food equally grateful to their palate; and the principal part of which is exposed on the surface. After having thus been lulled into security, and accustomed to find a regular supply for their meals, a skin of parchment is substituted for the wooden top of the cask, and the former is cut, for several inches, with transverse incisions through the centre, so as to yield on the smallest pressure. At the same time, a few gallons of water, to the depth of five or six inches, are poured into the empty cask. In the middle of this element, a brick or stone is placed, so as to project one or two inches above the fluid; and that one rat may find on the former, a place of refuge. These preparatory measures being taken, the boards as well as the top of the cask should now be furnished with proper bait, in order to induce them to repeat their visits. No sooner does one of these marauders plunge through the section of the parchment into the vessel, than it retreats to the brick or stone, and commences its lamentations for relief. Nor are its whining notes uttered in vain: others soon follow, and share the same fate: when a dreadful conflict begins among them, to decide the possession of the dry asylum. Battles follow in rapid succession, attended with such loud and noisy shrieks, that all the rats in the neighbourhood hasten to the fatal spot, where they experience similar disasters. Thus, hundreds may be caught by a stratagem, which might be great-

ly facilitated by exposing a living rat taken in a trap, or purchased from a professional rat-catcher.... Nay, if it be true, that a whole inhabitable island on the western coast of Scotland be infested with these destructive vermin, we are of opinion, that they could thus be speedily exterminated; and that the carcases of such animals as have hitherto been considered as useless, might be advantageously employed for the purposes of manuring the barren soil of those inhospitable regions.

A patent was lately granted to Mr. Bosquet, for his method of preventing the nuisance, and pernicious effects of rats, on shipboard, &c. This important object is to be attained, by filling up the vacant spaces between the planks, lining and timber of ships, with hot or melted pitch, tempered with a little tar, to render it less brittle, and more tenacious: at the same time, to increase its adhesion and durability, the patentee directs, cork-shavings, charcoal-dust, and ox or other animal hair, to be incorporated with the composition. By such contrivance, all rats will not only be effectually repelled, and consequently the destructive effects of these vermin living, breeding, dying, and rotting between the ship's timber, be avoided, but the safety of the vessel will also be ensured: for, in case a plank should start, he asserts that no water can penetrate through the composition.

The following preparation has also recently been recommended for expelling rats: it consists in mixing the expressed juice of the stalk or leaves of the Deadly Nightshade with wheaten flour, or oatmeal: the paste must be cut in small pieces which are to be placed in the holes or tracks frequented by these depredators; and, though they will eat such nauseous food, yet its odour is to them so extremely offensive, that they will speedily quit the premises.

[Rats may be effectually prevented from burrowing under the foundation of houses, by making an offset of stone or brick about two feet in breadth, and eighteen inches below the surface; and by carrying up a perpendicular wall from the edge of this offset, to within a few inches of the ground. The adoption of the same plan *inside*, will prevent the burrowing of these animals in cellars. For, rats always burrow close to a wall, and finding their perpendicular course impeded, they take a horizontal direction, as far as the offset continues, when they are again stopped by the outside wall. Thus baffled, they ascend and go off. Those persons who have suffered in their granaries, ice-houses, and in the cellars of their dwelling-houses, by the depredations of rats, will probably deem this one of the most valuable articles in the present work.]

RAT-TAILS, in farriery, denote certain excrescences that gradually extend from the pastern to the middle of a horse's shanks; and which are thus denominated, from the resemblance they bear to the tail of a *rat*. These warts sometimes appear moist; at others, dry: in the former case, they may be treated in a manner similar to that recommended under the article Grease; but, if the part affected be hard and dry, recourse should be had to the following ointment: Take of crude mercury one ounce; Venice turpentine half an ounce;

mix them together in a mortar, till the globules of the quicksilver disappear; then gradually add two ounces of melted hog's lard. This unguent must be applied to the excrescences; and, if it should not effectually soften them, and remove the protuberances, another preparation may be used with advantage: Let four ounces of black soap, and two ounces of quicklime, be incorporated with a sufficient quantity of vinegar, to form an ointment.

Should the warts still remain hard, it will be necessary to pare them carefully with a sharp knife; and to dress the wound with turpentine, tar, and honey; to which may occasionally be added a little verdigrease, or white vitriol.

RATAFIA, a species of *liqueur* prepared by imparting to ardent spirit the flavour of various kinds of fruit, especially that of cherries: there are different sorts of this compound, known under the names of common, red, and dry ratafia.

Common ratafia is obtained by infusing 2 oz. of nutmegs, 2½ lbs. of bitter almonds, 2 lbs. of Lisbon sugar, and 2½ grains of ambergrease in ten quarts of clear proof spirit. It will be proper to bruise the nutmegs and almonds; and also to triturate the ambergrease with the sugar in a mortar, before they are added to the other ingredients; and, when the whole has digested for a sufficient time, it may be filtered through a bag, and kept for use in close vessels.

Red Ratafia:.....Take 24 lbs. of *black-heart cherries*, 4 lbs. of the *common black cherries*, 3 lbs. of raspberries, and the same quantity of strawberries, which must be deprived of their stalks, and then bruised. In this state, they are to remain for the space of 12 hours; when the juice should be expressed, and a quarter of a pound of sugar be added to each pint. As soon as the latter is completely dissolved, the whole ought to be filtered, and mixed with three quarts of clear proof spirit. Next, one ounce of cinnamon, two drams of mace, and half a dram of cloves are to be bruised, and poured into an alembic, together with two pints of spirits, and one pint of water:.....one quart of spicy spirit should be drawn off with a brisk fire, and be added to the liquor: when the whole has properly subsided, it may be decanted for use.

Dry, or sharp Ratafia:.....Take 30 lbs. of cherries, a similar quantity of gooseberries, 7 lbs. of mulberries, and 10 lbs. of raspberries. These fruits must be cleaned, picked, and bruised; after which they should be suffered to stand for 12 hours. The juice is then to be expressed, and combined with three ounces of sugar to each pint.... When the latter is dissolved, the liquor must be filtered, and four pints of pure proof spirit mixed with every five pints of the former, together with the same quantity of *spicy-spirit*, as directed for Red Ratafia.

The chief use of this expensive liquor is, for imparting an agreeable flavour to puddings, pies, &c.; though, we fear, too many avail themselves of such pretext, and thus become habitual votaries to *dram-drinking*; than which, nothing is fraught with more mischievous effects, especially to females....See BRANDY and GIN.

SNAKE-ROOT. See RATTLE.

RAY-GRASS. See DARNEL, the Red.

RAZOR, an instrument employed for the purpose of removing the hair from the human beard or head.

As *shaving* is to many persons a painful operation, cutlers have applied all their skill and ingenuity, to remedy such inconvenience.... Hence strops, and washes, or soaps of a peculiar nature, have been contrived, with a view to facilitate that process; and some artists have so far succeeded, as to produce excellent instruments: the best, however, we believe, are those manufactured by Mr. SAVIGNY, of Kingstreet, Covent-garden; who has brought his *Patent Razors* to the highest degree of perfection, of which they are perhaps susceptible.

Much, however, depends upon the manner in which the razor is managed. The hone, therefore, ought first to be wiped perfectly clean, after which a few drops of sweet oil must be poured on it. The operator should next place his thumb and fore-finger *sideways*, on the part of the *heel*, in order to take firm hold both of the blade and of its handle: one side of the razor is next to be laid flat across the hone, in such a manner that its shoulder (or the part contiguous to the *heel*), may touch the nearest part of the stone. The razor is now drawn towards the person, somewhat circularly, and with a slight pressure, till he arrives at the point. When such side has been thus passed for a few times, the opposite one is to be conducted in a similar manner, till the edge uniformly assumes a *wiry* appearance. Lastly, both sides are to be moved a few times across the hone, from the heel to the point; in order that a perfect regularity may be produced in every part of the edge.

The razor, being thus *honed*, must now be drawn obliquely from the *point* to the *heel*, across a strop, that is perfectly flat; and which is furnished with two leathers on the smoothing side: after this operation, it is fit for immediate use....It deserves, however, to be mentioned, that those boasted powders, or unctuous preparations for giving a fine edge to razors, consist merely of *crocus martis*, or the red calx of vitriol, which is spread on the strop, by mixing it with a little oil or tallow.

Those of our readers, whose faces smart from the use of indifferent razors, or who may wish for farther instructions relative to their management, will meet with some pertinent hints on this subject, in Mr. KINGSBURY'S *Treatise on Razors*, &c. (8vo. 1*s.* 6*d.* 1797); in which it is fully and perspicuously discussed. See CUTLERY.

READING, is the art of delivering written language, with precision, energy, and a proper adaptation of voice.

This art is one of the most pleasing in domestic or civilized life; yet there are few, comparatively speaking, who possess, or endeavour to acquire it, so as to be enabled to read fluently.

There are numerous precepts that relate to this useful art; but we cannot specify and illustrate them, here, by proper examples. Those of our readers, who are studious of improvement, will meet with excellent instructions in Mr. SHERIDAN'S *Lectures on Elocution*,

(8vo. 7s); and especially in Mr. WALKER'S *Elements of Elocution*, (2 vols. 8vo. 12s.); in which proper rules are given, in clear and perspicuous language, and enforced by extracts from the best English writers.

RE-ANIMATION: See ANIMATION, COLD, &c.

REAPING, the operation of cutting corn, whether by the sickle, or by the scythe.

The most common practice of reaping is with sickles; though, where the scythe can be conveniently employed, it is certainly preferable, on account of its being less fatiguing, and far more expeditious. We are aware of the objections made by farmers against the latter instrument, namely, that it shakes the ear, and consequently numerous grains must be lost; and that considerable quantities are wasted, by the exposed state in which the corn is left, after being cut down. It is farther urged, that mowing is not only injurious to the health of the labourer, but also mixes noxious weeds among the grain; which when sown the succeeding year, often completely stifle the growth of the rising crop.

On the other hand, it may be maintained that, if a good scythe be judiciously managed by a skilful mower, the corn will both be cut more regularly, and fall to the ground with less concussion than if a sickle were employed. Thus, if the labourer work in the manner directed in the article MOWING, the objection arising from the unhealthiness of the practice will be completely obviated. On the whole, we are of opinion, that *reaping* is far more troublesome; and, as the reapers must be continually bending forward, more prejudicial to their health than *mowing*. To facilitate the latter operation, therefore, we propose to give in its proper place, an account of the best SCYTHES, that may be most advantageously substituted for sickles.

RECEIPT, in Commerce, is an acquittance or discharge in writing; the purport of which is, that the party has received a certain sum of money, either in full for the whole of a debt, in part, or on account.

[A friend communicates the following: "all receipt-books ought to have a left hand margin, to introduce the initial of the surname of the payees, and at the end of every receipt-book, an alphabet of the names with their dates should be made, for the more ready reference to answer any demands which might unjustly be made upon the account discharged."]

RED. In the 2d vol. of the *New Memoirs of the Royal Academy of Sciences*, &c. of Berlin, we meet with a communication by M. MARGRAAFF, containing an account of an excellent *red paint*. Its component parts are Dutch madder, and alum; which, being mixed with a small portion of the oil of poppies, afford a colour of exquisite beauty and lustre, far superior to the red obtained from cochineal, or any other vegetable substitute; while it is considerably cheaper; though, he observes, the quantity of distilled water used in the process, increases the expence of the preparation.

RED-INK, is a coloured liquor employed for the ruling of account-books, and other mercantile purposes. It is prepared by infusing

4 ounces of the raspings of Brazil-wood, and 2 drams of pulverized alum, in equal quantities, namely, a pint of rain-water and vinegar, for two or three days; at the expiration of which time, the infusion is boiled over a moderate fire, till the third part of the fluid be evaporated. It is then suffered to stand for three or four days, when it is filtered through blotting-paper, and preserved for use, in close vessels. There is no occasion for adding any gum-arabic, which only tends to suspend impurities, while it changes the ink to a pale purple shade..... Another mode of making red-ink, consists in triturating the whites of four eggs, and a tea-spoonful of pounded lump-sugar, with a similar quantity of spirit of wine, till they acquire an uniform consistence. Vermilion is then to be incorporated in such a proportion as will produce a red colour of sufficient strength. The liquor must be kept in a well-closed vessel, and agitated every time before it is used.

[*Another*.....Take three pints of vinegar, four ounces of ground Brazil-wood, simmer over a slow fire for half an hour, then add four ounces of alum, and one ounce of gum-arabic bruised, and when fully dissolved, strain through a cloth; bottle, and keep it corked.

REDEMPTIONER.....In the present instance, by a redemptioner, is meant a foreigner, who, not being able to pay for a passage to the United States, is indented for a certain time, to any one who will pay the passage-money.

The United States annually receive large importations of European *redemptioners*. For many years, the Germans were preferred, on account of their economical habits, sobriety, and laborious disposition. But many serious disappointments have lately taken place, in consequence of the importations of some cargoes composed of the refuse inhabitants of Hamburg, Amsterdam and Rotterdam, who robbed their masters, and eloped shortly after they were taken home.

Similar disappointments may be avoided in general, by inquiring the place of residence of the individuals it may be wished to purchase; and by chusing only those who come from the country, unless well recommended.

The importation of the worthless vagabonds of the commercial cities of Germany, and the Batavian republic, may become a serious evil in the United States, and should be immediately attended to. The American consuls of the above ports, would perform a duty they owe their country, by informing the governor of the state to which a passenger-vessel is about to sail, of the general character of the passengers; and whether they were residents of the town or country. The passes or permits which all are obliged to take, previously to their shipment, will readily furnish this information; and a complete list of the individuals might be transmitted, which, by being deposited with an alderman of the city, would serve to direct purchasers in a choice. Such a measure would serve as a check upon unprincipled persons who import indiscriminately all who offer for a passage; and at the same time speedily secure the honest countryman a master.]

RED-LEAD....See LEAD.

REDDLE, RADDLE, or RUDDLE, a species of marle, found in

various parts of Britain, particularly in the counties of Stafford and Derby.

This mineral is of a deep-red colour; and, on being handled, stains the fingers. It consists of clay and oxyd of iron: falls to powder in water; and when heated in the fire, becomes black.

Reddle is used in the manufacture of colours; in the marking of sheep; and, we understand, has lately been employed in Staffordshire, with great advantage, as a manure.

REED, or *Arundo*, L. a genus of plants, comprising 10 species; five being natives of Britain; of which the following are the principal, namely:

1. The *arenaria* (*Calamagrostis arenaria* of Dr. WITHERING) or Sea-Reed....See MATWEED.

2. The *phragmites*, or COMMON-REED, grows in rivers, lakes, ditches, and fenny or marshy situations, to the height of seven or eight feet: it is perennial, and flowers in the month of July..... This species is employed for covering cottages and barns; for which purpose it is superior to every other indigenous vegetable, being incomparably more neat and durable. By previously soaking the reeds in strong alum-water, such a roof may be rendered *fire-proof*. They are also manufactured into screens, for sheltering young plants from the cold winds; and may be usefully employed for cane-bottomed chairs. Farther, the Common Reed makes excellent *weaver's combs*, and is generally nailed across the frame of wood-work, to serve as the foundation for plastered walls, pillars, &c....From the dried roots of this plant, a very nutritive flour is easily obtained, which may be converted into wholesome and palatable *bread*. Its panicles are used, in Sweden, to impart a green colour to wool.

3. The *ephigeios*, (*calamagrostis ephigeios* of WITHERING) or WOOD REED, is perennial, grows in shady ditches, and moist situations, where it flowers in July.....This herb abounds particularly in the Isle of Ely, and is called by the inhabitants of the fens, *Maiden-Hair*:.....it is manufactured into *hassocks*, or thick mats, for churches.

4. The *calamagrostis* (*lanceolata* of Dr. WITHERING) SMALL or HEDGE-REED, is likewise perennial; grows in moist shady hedges, and meadows; where it flowers in the month of July. This species is remarkable for its beauty, and is an ornament to ditch-banks and hedges: it is rejected by cattle. Prof. PALLAS observes, that the panicles of the small reed, before the flower expands, impart a beautiful bright-green colour to wool, when boiled, with the addition of alum.

[REFINING, Citizen DARCET, (nephew), in the *Journal de Phisique*, year 9, gives a description of a new process of refining gold, which he has successfully practised; a translation of this paper is inserted in NICHOLSON'S *Philosophical Journal*, 8vo. vol. 5. p. 70. Those concerned in the business, will find their advantage in attending to the paper.]

REGIMEN, of Invalids: See DEBILITY.

RENNET, or RUNNET, properly denotes the coagulated milky substance which is found in the stomachs of calves that have received no other nourishment than the maternal milk. It is however, generally applied to signify the sto-

mach itself, which possesses equal properties.

The rennet commonly employed, consists of the inner membrane of a calf's stomach, which is cleaned, salted and suspended in paper bags. Previously to its use, the salt is extracted by washing the rennet, which is soaked in a little water during the night; and, in the morning, the infusion is poured into the milk, with a view to coagulate this fluid. As the preparation now stated, greatly contributes to the superior quality of English cheese, the proper management of it ought to be conducted with the strictest attention to cleanliness: the reader will therefore, find a receipt for making an excellent rennet, in the article CHEESE, vol. 2d.

It sometimes happens, however, that no rennet, sufficiently good for curdling milk, can be procured: hence various plants have been advantageously substituted, and found to answer the same purpose. The principal of these are the flowers of the Cheese rennet, or Yellow Ladies Bed-straw (*Galium verum* L.) used in England; and the Cardoon (*Cynara cardunculus* L.) in Spain. A strong infusion is made of the *down* of the latter vegetable in the evening; and, on the succeeding morning, half a pint is poured among fourteen gallons of new milk, which is thus effectually coagulated, and in consequence produces a delicious cheese.

[Under the article CHEESE, particular stress was laid upon the importance of attention to the preparation of this article; and it may be added, that according to Dr. AIKIN, "the principal late improvement in cheese making in Cheshire is in the mode of infusing all the maw skins at once, and saturating the strained liquor with salt. See AIKIN's *description of the country round Manchester*, p. 47.]

RESERVOIR, a place artificially constructed for the collection and retention of water, in order that it may be conveyed to distant places, by means of pipes.

Reservoirs are at present chiefly employed for the supply of fountains, *jets d'eau*, and similar volumes of water. Although such contrivances heighten the picturesque scenery of plantations, yet we conceive that they might be rendered productive of greater advantage to agriculturists, by forming them in certain situations, for the reception of *flood-waters* and the prevention of many accidents, that happen in consequence of land-floods. Where the soil is naturally porous, and the strata, lying beneath, are so open as to absorb the rain-water during its descent, no floods will easily occur; because the fissures or pores operate as regulators for conducting the streams; and the discharge becomes so equal, that the humidity remains nearly in the same state throughout the year. In clay, and similar retentive lands, however, a very small portion of water is absorbed, and such large quantities speedily glide off the surface, so that either extreme scarcity or superfluity is the necessary result. With a view to remedy these inconveniencies in such soils, it has been proposed to form reservoirs of any depth, and and breadth, that may be best adapted to the purpose; and, as during the heat of summer, the water would be absorbed to the depth of eight or nine inches, this

diminution of its volume may be obviated, by raising the top so many inches higher than might otherwise be found expedient. Farther, such reservoirs may communicate, by means of subterraneous pipes or channels, with some rivulet or brook, that in summer is nearly dry, but which in the winter is swoln into torrents. In consequence of these hydraulic measures, a regular supply of water will be obtained at all seasons, for the irrigation of fields or meadows; and also for turning mills, or other machinery, where a certain velocity is required; so that the extensive damage frequently occasioned by sudden floods, will thus be effectually prevented.

REST-HARROW, the Thorny, Cammock, Petty-Whin, or Ground-Furze; *Ononis spinosa*, L. (the *arvensis* of Dr. Smith) an indigenous perennial plant; growing on barren pastures, hedge-banks, and paths; it flowers in the month of July.....The young shoots of this plant may be boiled and eaten among culinary vegetables. Dr. Withering remarks, that a decoction of the roots has been recommended in cases of the stone and jaundice....Cows and goats eat the Rest-harrow; though sheep do not relish it, and it is refused by horses and hogs.

RHEUMATISM, a painful disease which principally affects the muscular parts, and larger joints of the body, in the direction of the muscles; such as the shoulder, hip, knees, &c....If attended with fever, it is called the *acute* rheumatism; but, in the contrary case, the *chronic*: in the former, the pain generally shifts from one joint to another; in the latter, it remains in most cases fixed to a particular part. After the disorder has tortured the patient for some time, the joint is commonly swoln, red, and extremely painful to the touch.

As it is often difficult to distinguish *rheumatism* from *gout*, it should be remarked, that, in the former, the stomach is less affected; that the disease is more confined to the larger joints; that it occurs at an earlier stage of life; and that it is not hereditary. In young persons, the upper and internal parts *above* the midriff, but in the aged, those *below* the diaphram, are more frequently liable to be attacked....It is termed according to the seat of the malady: thus it is called *lumbago*, when seizing the loins; and *ischias*, or *sciatica*, when it rages in the hip. Rheumatisms prevail in cold climates, and mostly in spring and autumn; though they may appear at any season, in consequence of sudden alternations of heat and cold.

We shall briefly enumerate the leading causes, from which they arise, namely: suppressed perspiration, by moist, cold air, especially at night; damp clothes; partial heat or cold; suppression of chronic eruptions; inhalation of metallic vapours; violent passions; and often too, after recovering from other disorders, such as fevers, fluxes, &c. in which case it is generally *chronic*.

Cure....If the disease be attended with fever, every thing must be avoided, that may tend to irritate the system, or increase the violence of the circulation. The acute rheumatism being an inflammatory affection, the advice of the

profession becomes indispensable; in order to determine upon the propriety or necessity of blood-letting, and whether this operation is to be repeated: beside which, it requires total abstinence from animal food; fermented and spirituous liquors; the use of a mild vegetable or milk-diet; together with copious draughts of bland, diluting beverage. To void the debilitating effects of too frequent venesection, in cases of excruciating pain, especially when attended with swelling and redness, recourse may be had to *leeches* applied to the part, or to *cupping*. The principal relief is next to be expected from gentle sudorifics, when the perspiration should be promoted by lukewarm drink. If the disorder be transferred from the external to internal parts, blisters must be appplied to the spot, which was previously affected: all other local applications, except warmth, are in such cases improper. After the complaint is removed, the patient should avoid all sudden changes of temperature, and at the same time apply friction to the parts formerly diseased....During the whole affliction, it will be proper to preserve regularity of the bowels, by taking rhubarb, manna, flowers of sulphur, and similar laxatives, in small doses.

The chronic rheumatism is frequently consequent on the acute, when the latter has been mismanaged: hence it will be advisable to resort to such external and internal remedies, as may restore vigour to the parts, and promote the necessary evacuations, especially a proper state of perspiration. Gentle sudorifics, such as infusions of elderflowers, white-wine whey, and ipecacuanha in small doses, have often procured relief; but the more active medicines, for instance, the *oil of turpentine*, *guaiacum*, and *antimonials*, must be cautiously *prescribed*. With the same intention, we shall observe, that the extract of the Large Blue Wolf's-bane (*Aconitum Napellus*, L.) has been found uncommonly efficacious in restoring perspiration, and dispersing the swelling; but, like other narcotics recommended for this purpose, it requires great circumspection.

As costiveness frequently retards the cure, it ought to be relieved by the mildest laxatives. The diet should, in general, be nourishing; and generous wine, moderately taken, will greatly conduce to recovery. The external means are, warmth by flannel worn next the painful part; frictions, vapour-baths, electricity, exercise, and the volatile liniment; but the other oils and unctuous preparations must be avoided; as they are apt to check perspiration, and thus to protract the disorder.... Lastly, blisters, and cataplasms of mustard, horse-radish, leaven applied to the suffering parts, or to their vicinity, have often proved beneficial.

The *Lumbago*, *Sciatica*, &c. being a species of the same disease, require a similar treatment; though the rheumatism of the hip may, in general, be successfully removed by a blister six inches long, and four broad, applied to the outside of the leg, immediately under the knee, and kept in a state of suppuration, till the pain ceases.

RHODIUM, an odoriferous es-

sential oil, obtained from the wood of a species of the *Aspalathus*, or African Broom; and which has received its name from the Island of Rhodes, whence it is said to be imported.

Oil of Rhodium was formerly in great repute as an astringent and corroborant; but, at present, it is chiefly employed in perfuming pomatums; an ingredient in rat-powders composed of poisonous substances; as these noxious vermin are uncommonly partial to the agreeable scent of the drug.

[RHODODENDRON, a genus of plants comprehending two species, natives of the United States. The *R. maximum*, or Pennsylvania mountain Laurel, is a highly poisonous shrub. *R. aromaticum*, of W. BARTRAM, (the *R. punctatum* of WILDENOW) was discovered by the former upon the Cherokee mountain in N. Carolina.]

RHUBARB, or *Rheum*, L. a genus of exotic plants, comprising seven species, of which the following are the principal:

1. The *rhaponticum*, or Common Rhubarb, a native of Thrace and Syria, which has long been cultivated in British gardens for the footstalks of the leaves, that are frequently used in pies and tarts. The root of this species is sometimes mistaken for the officinal rhubarb, from which it differs materially; as the surface of the former is of a dusky colour, its texture, is more porous or spongy and it possesses greater astringency than the latter, but is less purgative, requiring two or three drams, instead of fifteen or twenty grains of the powder, for one dose.

2. The *palmatum*, Palmated, True or Officinal Rhubarb, is a native of China and the East Indies, whence its culture has been introduced into Europe. It produces a thick fleshy root, externally yellowish-brown, but internally of a bright-yellow colour, streaked with red veins; and it endures the severity of our climate.

The officinal rhubarb is raised from seed, which should be sown early in April, in light, sandy soils that have been previously ploughed to a considerable depth, and manured with a compost, consisting of one part of rotten dung, one part of sifted coal-ashes, and two parts of slaked lime, thoroughly incorporated with a proper quantity of mud, or mire taken from a mill-pond. This species is also propagated, by planting buds or eyes in land thus prepared; which method is far superior to that before described; as a whole year is not only gained in the growth, but the plant is less liable to be injured by the depredations of vermin; and, in the course of four or five years, the *crowns* of the rhubarb will produce tolerably good roots; which, however, are neither so large nor so plentiful as those obtained from seed.

When the plants appear above ground, they will only require to be kept clear from all weeds; and, if the roots be covered with litter, or the earth be drawn around them, in the winter, they will vegetate with renewed vigour in the spring. Should they grow too closely together, it will be necessary to *thin* them, at the distance of five, or six feet; and, at the expiration of four years, the roots may be taken up for use; though their medicinal properties are supposed to increase, if they be suffered to remain in

the earth for seven, eight, ten, or even twelve years.

[Mr. Thomas Jones, of London, who has cultivated the palmated or medicinal rhubarb very largely in England, gives the following directions on the subject.

1. The situation is not material, provided it be not too much shaded on the south or west..... The indispensable points are *depth* and *good soil*. A gentle declivity is most proper.

2. If the ground be in greensward, suffer a season or two to elapse, that the turf may be entirely decayed, and that the destructive *wire worm* which infests old grassland, may be destroyed. Sow early in the spring, and if the seeds do not vegetate in three weeks, repeat the sowings. The broad cast mode is preferable to drills.

3. Prepare beds of *fine mould*, 18 inches deep: in these, put in the plants when they have attained the heights of four or five inches, and have thrown out as many leaves. They must be eight inches asunder. The first season is the most critical, and much care is necessary. If the weather be hot, the nursery must be shaded, and at all events continually watered; for water, though *hurtful to old plants*, is now of the first consequence. Wet weather is the most proper to plant. In a month, the roots may be transplanted, or they may remain in the nursery beds till the ensuing spring: if the summer be favourable, and in the meantime the land intended for the plantation, is properly prepared, it should be completed, without further delay. After trenching the ground three feet deep, when not on a declivity, sow it with carrot-seed of the largest sort; and at different periods thro' the summer, with a transplanter or circular spade, remove the rhubarb plants and place them four feet apart, in the midst of the carrots; destroy those which might obstruct the growth of the other; their foliage will preserve the plants from the rays of the sun, till their own have acquired a sufficient growth. After this, keep the plantation clean, and the trenches open. Each trench is to communicate with a ditch, to convey the water from springs or rains away.

Mr. Jones is of opinion that those parts of the root are of the finest quality, that are farthest removed from seed; and, but for want of offsetts, he should abandon his present, in favour of this mode of cultivation. The other however is more certain, and the produce much more considerable. When the seed stalks are cut off, (which ought to be done upon the withering of the radical leaves,) cover the plants with mould, in the form of a hillock. When the buds have bloomed, a cavity is formed in the centre of the plant, surrounded by the rest, into which the rain, if permitted, will make a lodgment, and destroy the part. For this reason, every spring and autumn examine the plant.....the young ones will discover their situation, for either the leaves will wither as fast as they are produced, or their growth will be stunted; the state of the older plants can only be discovered by pressing a finger to the centre of the crown; the least unsoundness will soon be perceptible. In both cases, the plants must be removed, and their places suppli-

ed. Mr. J. places his plants four feet apart.

The Rev. JAMES STILLINGFLEET of Hotham, Yorkshire who, was also rewarded by the *Society of Arts*, with their premium, for his successful cultivation of rhubarb; .....directs the seed to be sown on a sandy-loam, having a south-east aspect, but the young plants must be sheltered from the noon day sun, till they have obtained a good degree of strength. It will conduce to their strength and growth, to raise the bed some-what above the alleys, that the plants may be kept dry. Much dung disposes to canker; a good free soil, suits best. He prefers taking the roots up, at the winter solstice, as they dry better and shrink less, than at other times. The roots lose four fifths in drying; which process is accomplished in half a year, when the roots are cut into pieces and hung up in a common kitchen; the skin being previously pared thin. The large pieces are quartered, that they may dry.

Rhubarb must not be taken up, until six or seven years old. In this point all cultivators agree.

There can be no doubt that the climate of the United States is perfectly congenial to the growth of *rhubarb*, and considering the great value of the medicine, its cultivation ought to be attempted.]

The proper time for taking up the roots, in England, is from the middle of the summer to January; though they are sometimes dug out of the ground early in the spring; or in autumn, when the leaves are decayed. They are first washed clean, and the small fibres and external rind being pared or cut off, they are divided into pieces about one ounce in weight. In warm weather, they should be dried in the shade; but, if the season be cold or wet, it will be advisable to evaporate their moisture *gradually* in a hot-house, or an oven of a moderate heat; because, if dried too speedily, they will contract into wrinkles, and, if too slowly, they become mouldy, and unfit for use. Lastly, a hole is perforated in the middle, and the roots are suspended on packthread to dry, so that none of the pieces come in contact with each other.

The rhubarb, hitherto employed in medicine, is imported from Turkey, Russia, China, and the East-Indies. The first sort is brought in roundish pieces, perforated in the centre; and which are externally of a yellow colour; but, on being cut, they appear variegated with bright-reddish streaks. The *Chinese* drug is imported in long pieces, which are harder and more compact than the Turkey Rhubarb; the former, possessing a weaker aromatic flavour, is less esteemed; though, being more astringent, it is, for some purposes at least, equal to the latter.

Rhubarb is justly prized as a mild cathartic, and may be safely administered to children, invalids, and delicate women, in doses of from 10 to 20 grains, though, in irritable, hysterical, and phthisical habits, it is apt to occasion gripes, and to aggravate febrile symptoms: hence it ought never to be given in the first stage of dysentery, when this invaluable remedy, by premature use, may occasion the most violent pain and inflammation of the bowels; but, after the fever is suppressed, and the disease becomes a chronic di-

arrhœa, small doses of rhubarb will be attended with the best effects. As, however, this medicinal root has a tendency to occasion obstructions of the intestines, it will, in most cases, be proper to combine it with cooling salts, in order to prevent costiveness: thus, 6 grains of the former, and one dram of either Glauber's salt, or cream of tartar, in a combined state, may be taken with advantage in the evening, and a similar dose in the morning. In short, rhubarb is the only purgative we possess, that is at the same time mildly astringent, diuretic, and does not relax the first passages.

Being an article of such importance in medicine, large quantities of this root are annually imported, to the amount of 200,000*l.*; which sum might easily be saved to the nation:.....various attempts have, therefore, been successfully made to introduce its culture into Britain. With this intention, the patriotic *Society for the Encouragement of Arts*, &c, have, for several years, distributed premiums for the cultivation and *curing* of the largest quantity of rhubarb. The successful candidates, were Sir WILLIAM FORDYCE, on whom they conferred a gold medal in 1784; Mr. THOMAS JONES, whom they rewarded with a similar premium in 1793, and with the farther sums of 30 guineas, in 1798, and 1800; Mr. HAYWARD, on whom they conferred their gold medal in 1794; Mr. BALL, to whom they adjudged a similar reward in the same year, and a second in 1795; Mr. ROBERT DATIS, and the Rev. JAMES STILLINGFLEET, on whom they severally bestowed gold medals in 1796 and 1797, for their respective exertions in cultivating and curing the true rhubarb. Their methods of management correspond, with a few exceptions, to that above stated; and it appears from authentic accounts, that sufficient quantities of this valuable drug may be reared in Britain; and that the English root has proved to be fully equal to the best sort obtained from Turkey and China.

Beside the utility of the roots, the seeds of such plants as are raised in England, possess a considerable portion of the medicinal properties of the former: its leaves impart an agreeable acidity to soups, similar to that of sorrel: a strong infusion in white wine, of pieces of the roots, that were not sufficiently thick for drying, has been given with great success in the dysenteries sometimes incident to cattle. A marmalade is likewise prepared from the fresh stem, by stripping off the bark, and boiling the pulp with an equal quantity of honey or sugar. This, we understand, affords a mild and pleasant laxative, especially for children, to whom it is highly salubrious.... Lastly, Prof. PALLAS informs us, that M. SIEVERS, an apothecary, has discovered a resinous elastic gum, which, in the month of August, exuded from the leaves and flower-stalks of the Siberianr hubarb, on wounding them with a knife; and which bore perfect resemblance to the CAOUTCHOUC, or India rubber....By a decoction of this root in alum-water, the Kirghis impart a beautiful orange colour to their leather and wool: a similar tint may be given to cloth; and, on adding green vitriol, a fine olive shade will be the result.

It has farther been conjectured, that, with a solution of tin, or bismuth, rhubarb would afford a beautiful red dye.

[RHUS, an extensive genus of plants, which are found in almost every quarter of the globe. In the United States, we find seven species, viz. *R. Typhinum*, *R. Copallinum*, *R. Glabrum*, *R. Canadense*, *R. Toxicodendron*, *R. Vernix*, and *R. Radicans*. The three last species, are most numerous in the southern parts of the United States.

1. *R. Typhinum*, or Stag's-horn Sumach, is a native of Virginia and Pennsylvania, rising to the height of twelve or fifteen feet, with a trunk of six or eight inches in diameter, and producing flowers of an herbaceous colour, which make a fine appearance in autumn.

2. *R. Copallinum*, *Lentiscus-leaved* sumach, grows to the height of six feet in a slaty, gravelly soil. The berries are very acid. The flowers are produced in loose, compound panicles, of an herbaceous colour, and are succeeded by reddish seeds, sprinkled with greyish pounce, of an agreeable acid taste.

3. *R. Glabrum*, smooth Pennsylvania sumach, common, or upland sumach, grows abundantly in Pennsylvania, rising to the height of eight or ten feet. The leaves are feathered, sawed, lanced, and naked on both sides, and change to a beautiful red in autumn: it flowers in July. The seeds are arranged like the flowers, in large conical *thyrses*; are red, and covered with a white powder, of an agreeable acid taste. From Dr. HORSEFIELD's accurate experiments,* it appears that the leaves are more valuable as a black dye, than the berries, (though the latter are commonly used) and a valuable substitute for *nut-galls*, either in dyeing, or in making ink.

4. *R. Canadense*. grows in Canada; its peculiarities have not been examined.

5. *R. Toxicodendron*, poison oak, a low shrubby stalk. Leaves trifoliate, with pretty long footstalks, lobes entire smooth, and somewhat heart shaped. The flowers come out from the side of the stalks, in loose panicles, are small and of an herbaceous colour. The berries are round, channelled and smooth, of a yellowish grey colour when ripe. Horses eat the leaves with impunity.

Dr. ALDERSON, of Hull, highly recommends from one to four grains of this species, three or four times a day, in paralitic affections.

6. *R. Vernix*, varnish tree, poison oak, swamp sumach, white sumach, is the largest of our native species of *Rhus*; grows in swamps, and makes a fine appearance. Dr. HORSEFIELD is convinced, with THUNBERG and others, that this is the true varnish tree of the Japanese: he found that the greatest quantity of juice was obtained from incisions made in the tree about the middle of May.

7. *R. Radicans*, poison vine, poison creeper, has a slender ascending stem, and frequently climbs up to the top of our tallest trees. The flowers are produced

* Inaug. Diss. on *Rhus Vernix*, *R. Radicans*, and *R. Glabrum*, Phil. 1797.

along the whole course of the smaller branches; they are small, are of a light yellow colour, and have a delightful odour.

The two last, viz. *R. Vernix*, and *R. Radicans*, are highly poisonous, and are particularly active in warm weather; after a meal; and when the part touching the leaves is moist with sweat.

The *R. Vernix* is more violent than the other species, and affects, 1. By its effluvium; 2. By its smoke when burning; 3. By contact; 4. By steams of a decoction of the plant. The poison induces an inflammatory eruption in the skin, attended by pain, swelling, itching, and fever. The eruption sometimes ends in suppuration, and ulceration. The above symptoms are apt to return periodically, for the course of even ten years.

The remedies are blood-letting when the symptoms are violent, smart purging, especially by *sea-water*; by cold water, or ice, or a a solution of *corrosive sublimate* in in water applied to the parts; or a wash of spirits of *sal-ammoniac* diluted with water, or of lead water.

Dr. Du Fresnoy, in his *Treatise* on the *Rhus Radicans*, Paris, 1788, relates the successful use of the extract of the plant in a case of palsy, which was ascribed to the suppression of an *herpetic* eruption. Other cases of palsy were also cured. The dose was two grains at first, and then gradually increased. The above facts are chiefly taken from Dr. Horsefield's excellent dissertation.]

Rib-grass. See Ribwort Plantain.

RIBS *(Costæ)*, in the human frame, are certain long bones of a semicircular figure. There are twenty-four in number, namely, twelve on each side the twelve vertebræ of the back, or the spinal column. They are divided into seven *true*, which are uppermost, and five spurious, or *false* ribs, which are softer and shorter; only the first of the latter being joined to the extremity of the breast bone, while the gristly ends of the rest are combined with each other, and thus leave a greater space for the dilatation of the stomach and bowels. It is farther remarkable, that the cartilages throughout the ribs, are harder in the female than in the male subject, obviously with the view of enabling the former to support more easily the weight of their breasts;....that the last of the false ribs is perceptibly shorter than the rest, and is not joined to them, but in some persons to the oblique descending muscle;....that Nature has providently not constructed the ribs like the other solid, *articulated* bones; in order to admit of such a degree of expansion in the thorax or chest as is requisite to perform the important process of breathing. Hence, if in an easy inspiration the cavity of the thorax is raised 1-8th of an inch, and the midriff descends only $1\frac{1}{2}$ inches, it will afford room for 52 cubic inches of air to enter; so that, in an ordinary inspiration, the lungs are distended with 70, and sometimes 100, inches of atmospheric air. Lastly, the ribs serve to defend the vital organs, and to impart adhesion to the muscles.

The principal casualties incident to the ribs, are *fractures*, and *luxations*. The former may be easily ascertained, on pressure with the fingers. The symptoms are seldom accompanied with aggravating circumstances, and the patient

speedily recovers. If, however, the fracture be *compound*, or the bone depressed on the lungs, a very acute pain will be felt; breathing become difficult; and be attended with cough, sometimes with blood-spitting; while a full and quick pulse will indicate the presence of fever. In such cases, it will always be proper immediately to apply for surgical assistance, and perhaps to lose a few ounces of blood. If one end of the rib be elevated, it ought to be reduced by moderate compression; and a broad leather belt should constantly be worn tightly around, for several weeks. Should any part of the rib be forced inwards, it must be carefully raised by the surgeon; and, if any air or extravasated blood be collected in the cavity of the chest, these fluids are to be timely and cautiously extracted.

Luxations of the ribs seldom occur. The symptoms correspond with those attending fractures, excepting that the pain is more acute at the articulation, which part alone will yield on pressure. In this case, the patient's body should be slowly bent over a cask, or a similar round vessel, in order to expand the ribs, and thus to reduce the luxated bone; as no bandages will afford any relief. In all accidents of this nature, however, the patient ought to be kept on low and cooling diet; to avoid whatever may tend to irritate or disturb his mind, lest inflammation might ensue; and, if the cough be troublesome, it will be advisable to employ opiates (especially by means of unguents externally) with a view to allay its virulence.

RICE, or *Oryza*, a genus of plants consisting, according to LINNÆUS, of only one species, viz. the *sativa*, or Common Rice; though later botanists enumerate three or four species, each of which is divided into two varieties. It is a native of Ethiopia, and the East Indies, where it is cultivated to a considerable extent; as it constitutes the chief food of the inhabitants. They divide it into *six* kinds, which, however, may be reduced to the following two varieties, namely, 1. *Mountain-rice*, that grows on dry, elevated soils, manured with ashes; but, as the crops often fail, it is of a higher price than the next sort, and little known in Europe; though its grains are finer, whiter, more palatable, and may be longer preserved. Lately, this variety has with success been cultivated in Tuscany. 2. *Marsh-rice*, which is the usual kind sown in low, swampy districts, that may be easily inundated by means of sluices. Of this productive grain, large quantities are annually imported into Britain, and other parts of Europe; where it is highly esteemed for puddings and other culinary preparations.

[For the following directions respecting the *water culture of Rice*, the Editor is indebted to a friend, for whom it was written some years since, by one of the most successful cultivators of that article, in the state of South-Carolina.

Begin to plant about the 25th March, trench shallow and wide, and scatter the seed in the row; make 72 or 75 rows in a task, and sow two bushels to an acre.

1st. Hoe about the end of April, or beginning of May, when the rice is in the fourth leaf; then flood, and clear the field of trash. If the planting be late, and you are likely to be in grass, flood before hoeing; but hoeing first is pre-

ferable. The best depth to flood is three or four inches. It is a good mark to see the tops of the rice just out of the water: the deep places are not to be regarded; the rice will grow through in three or four days. Observe to make a notch on the frame of the trunk, when the water is at a proper depth: if the rains raise the water above the notch, or it leaks out, add, or let off accordingly. This is done by putting a small stick in the door of the trunk, about an inch in diameter: if scum or froth appear in eight or ten days, freshen the water, take off the trunk doors, run off the water with *one ebb*, and take in the next *flood*: then regulate as before. Keep the water on about fifteen or seventeen days, according to the state of the weather; that is if a hot sun, fifteen days, if cool and cloudy, seventeen days, counting from the day the field is flooded: then leak off with a small stick for two days, then run off the whole, and keep the field dry. In four or five days after, hoe the second time, stir the ground whether clean or not, and comb up the fallen rice with the fingers. Keep dry and hoe through the field. Hoe the third time and pick clean. This will be about the beginning of July. Then flood as you hoe. Let the water be the same depth as before. If any grass has escaped, it must be picked in the water after it shoots out. This is called the fourth hoeing, but the hoe is never used except for some high places or to clean the dams. If the rice is flaggy and likely to lodge, flood deep to support it, and keep it on until fit to harvest.

For a particular account of the introduction of rice into South-Carolina, and of the modes of cleaning it, the reader is referred to "DRAYTON'S view of S. Carolina. Charlestown, 1803.

Mr. BORDLEY informs us that he raised rice many years since, in the dry sandy soil of Annapolis; and even "in a clay loam or upland in Talbot, Maryland, the produce whereof was good in quality and quantity." The experiment might be tried in N. Jersey, in sheltered situations with greater prospect of success. The time of sowing is early in the spring after frost.

A friend concerned in rice planting in South-Carolina, was in Amsterdam in 1784, and examined all the various specimens of rice to be found in that great emporium of commerce. He saw the rice of every country, in which it is cultivated, except that of Brazil, and was gratified by finding that the American rice was superior in size and whiteness to all he had an opportunity of seeing.]

Rice is, in the opinion of Dr. CULLEN, preferable to all other grain, both for its abundant produce, and the large portion of nutriment it affords. Hence, different methods have been devised, of cooking or dressing it in the most economical manner. Thus, if a quarter of a pound of rice be tied loosely in a cloth capable of holding five times that quantity, and then slowly boiled, it will produce above a pound of solid food; which, eaten with sugar, or boiled milk, forms a very palatable dish. And, if an egg, together with a quarter of a pint of milk, a small quantity of sugar, and grated nut-meg, be added, it will afford a more

agreeable pudding than those prepared either of wheaten flour, or bread. One of the best preparations of this grain, however, especially for invalids, is its mucilage or *jelly*; which may be obtained by boiling two ounces of fine rice-flour, with a quarter of a pound of lump sugar, in a pint of water, till it become an uniform gelatinous mass: on being strained through a cloth, and suffered to cool, it constitutes a salubrious and nourishing food.

Rice also forms an excellent ingredient in preparing BREAD; and, as we have already given a concise account (vol. i.) of the methods in which it may be advantageously used, we shall now subjoin two receipts, by way of supplement. For this purpose, it is directed in the first vol. of the *Reports of the Society for increasing the Comforts of the Poor*, to boil a quarter of a pound of rice till it become perfectly soft; when it should be drained on the back of a sieve. In a cold state, it is to be mixed with three quarters of a pound of flour, a tea-cupful of yeast, a similar portion of milk, and a small table-spoonful of salt. This composition should be suffered to stand for three hours, at the expiration of which it must be kneaded, and rolled in a little flour, so as to render the outside sufficiently dry to be put into the oven. In an hour and a quarter it will be baked, and produce 1 lb. 14 oz. of good white bread; which, however, ought not to be eaten till it has been kept 48 hours.

In a late volume of the *Journal des Sciences, des Letters, et des Arts*, we meet with an essay *on making bread from rice alone*..... The first step directed to be taken, is the reduction of the rice into flour, by grinding it in a mill; though if such machine cannot be procured, it may be effected in the following manner: Let a certain quantity of water be heated in a saucepan, or other vessel; when it nearly boils, the rice must be thrown into it, and the whole taken off the fire, closely covered, and the grain suffered to macerate for twelve hours. The water is then to be poured off; and, when the rice is drained, and completely dried, it must be pulverized (it is not stated by what means) and passed through a very fine sieve.

The grain being thus converted into flour, a sufficient quantity is to be put into the kneading-trough: at the same time, a little rice should be separately boiled in water, till a thick and glutinous decoction be obtained. While this liquor is still lukewarm, it ought to be poured on the rice-flour, and both should be well kneaded together, with a proper quantity of leaven, or of yeast, and also with a small portion of flour; in order to impart to the whole a greater degree of consistence. Next, the dough is to be covered with warm cloths; and, when it is sufficiently risen (the oven having been heated during that interval), it should be poured into a tin stew-pan, furnished with a long handle, and covered with a sheet of paper, or with a cabbage-leaf. The pan is then pushed forward into that part of the oven where it is intended to be baked, and expeditiously inverted. A proper degree of heat will prevent the paste from spreading, and cause it to retain the form of the vessel. In this manner, pure rice-bread may be made; which, when drawn out of the oven, is said to acquire a

fine yellow colour, similar to that of pastry glazed with the yolks of eggs. It is very wholesome and agreeable, but loses its good taste, if it be suffered to become stale.

With respect to the properties of rice, we shall only observe, that it is uncommonly nutritive, and may with great benefit be taken in diarrhœas, dysenteries, and similar disorders. In some persons it is apt to produce flatulency and costiveness; hence it will, in general, be advisable to eat this grain with the addition of a little cinnamon, caraway, or similar spices, to prevent these effects; especially in those whose digestion is slow, or who are naturally of phlegmatic habits.

RICKETS, a disease peculiar to infants from the age of 9 months, to the third year; and which seldom continues till they attain to puberty. Its principal symptoms are, a large head, a prominent forehead, a relaxed skin, and swelling of the belly. The joints acquire an unnatural size; the bones, especially those of the legs and arms, become curved; and the cartilages of the ribs being deprived of their elasticity, are unable to support the chest; in consequence of which, it projects and grows deformed. In the progress of this malady, the belly is extremely tumid and hard to the touch, particularly on the right side; the teeth become black and carious; and the general emaciation is such as to leave the patient almost inanimate, having power only to move the neck and head.

The *proximate* cause of the disorder is now understood to be a *deficiency* of the *phosphate of lime*, or *animal gluten* in the bones: hence the latter are deprived of that necessary strength and solidity, in consequence of the prevailing debility in the vessels, so that the former, instead of being conveyed to the bones, is deposited in other parts of the body. Thus, we find particles of lime often evacuated by the urine, or sometimes lodged in the genitals....See also Bones.

Among the *pre-disposing* causes, we shall briefly mention, the neglect of proper exercise, or what may be called *bad nursing*; frequent exposure to damp or mephitic air in close habitations; an improper system of living, with respect to food and drink; for instance, watery and mealy substances, particularly viscid pap, pastry, fish, salt-meat, and other articles, too difficult of digestion. Sometimes, however, it arises from the vitiated habits of parents; or is consequent on other diseases, such as small-pox, measles, &c.

Although the rickets do not, in general, prove fatal, when timely attended to, yet this affection is not unfrequently followed by a curvature, and even a decay of the bones, particularly those of the arms, legs, spine, &c.

In the cure of this malady, mild, opening, and strengthening medicines have been found useful: of the former, we recommend small doses of ipecacuanha, to act as a gentle emetic; rhubarb and manna, with the addition of nutmeg, or fennel-seed. Among the safest astringents, are quassia, Peruvian bark, and calcined zinc, in very small proportions, to be frequently repeated; but the cold bath, fresh air, and moderate exercise, are eminently beneficial. Iron filings, though considered a specific cure for this complaint, should be prescribed only by the faculty.

In the western isles of Scotland, the rickets are effectually cured by an oil, extracted from the liver of the skate-fish: with this intention, the wrists and ancles are rubbed with such oil in the evening, so that a fever of several hours duration is immediately excited. On the following evenings, the same operation is repeated, as long as the unction of those parts produces similar effects. When no febrile action can be induced by the friction of the wrists and ancles alone, they are then rubbed together with the knees and elbows; in consequence of which a new fever ensues; and this practice is continued accordingly. Then, the spine and loins are to undergo the operation, together with the former parts, to re-produce the symptoms of fever; and, when these likewise are no longer susceptible, a flannel shirt, dipped in the oil, is put upon the body of the patient; by which expedient a fever more violent than from any of the preceding applications is roused, and this general covering is worn next the skin, till the cure is completed; an event which generally takes place within a short time. We have stated this *heroic* remedy, on the authority of Dr. Duncan, sen. of Edinburgh; who has inserted it in the 17th volume of his *Medical Commentaries*: but we apprehend, that few *English* parents will be inclined to submit their infants to this febrile stimulation; though we entertain no doubt of its efficacy, provided it be equally safe.

RICKETS, *in Sheep*, a disorder which occurs chiefly in the county of Huntingdon, whither it is by some farmers supposed to have been introduced from Holland.

This malady is one of the most fatal that can happen in a flock; for, as its causes have never been clearly ascertained, all the remedies hitherto employed for its removal, have uniformly failed of success.

The first symptom that indicates the presence of the rickets is, a species of giddiness, in consequence of which the sheep appears unusually wild and ferocious; starting up suddenly, and running to a considerable distance on the approach of any person, as if it were pursued by dogs.

In the second period, the chief characteristic is a violent and inflammatory itching in the skin; the animal rubs itself furiously against trees, hedges, and the like, so as to pull of the wool, and even to tear away the flesh: no critical discharge, or cutaneous eruption takes place, and every circumstance indicates the most violent fever.

The last stage of this malady, is the progress towards dissolution, which at length follows; and the animal, after having reeled about, lain down, and occasionally eaten a little, falls a victim to a general consumption.

The rickets appear in the spring; and are *hereditary*: thus, after remaining latent for one or two generations, they break forth with increased violence. And as they appear suddenly, the utmost precaution of the most judicious graziers cannot detect the malady; so that no other choice remains, but immediately to cease breeding from the infected stock.

Having already observed, that the cause of the rickets is unknown, it is to be apprehended that the aversion evinced by breeders, to make proper inquiries, will probably contribute towards perpe-

tuating this veil of ignorance. Nevertheless, we deemed it useful to state the symptoms that indicate the disease: such of our readers as may wish more fully to investigate this subject, may consult Mr. Comber's practical essay, entitled *Real Improvements in Agriculture*, &c. (8vo. Ls. 6d. 1772), in which it is amply discussed; and an account is given of the steps that have been taken to ascertain the cause and seat of the rickets in sheep.

RIDGES, in agriculture, are long but narrow tracts of rising soil, that intervene between two furrows.

Ploughing in *ridges*, is chiefly practised on wet lands; in order that the water may discharge itself into the furrows, and be thence conveyed by means of drains, or ditches, into some brook or rivulet. If the soil be deep, such ridges should be narrow; but, in shallow situations, they should be made broader; and, as the best or richest mould is collected in the tops, or crowns, it will be advisable to manure the sides, which, being necessarily rendered poor, would otherwise produce indifferent crops. Thus, the ground will become nearly of equal fertility, so long as the ameliorating properties of the dung or compost remain.

Great attention, however, is requisite, in forming ridges where the land is on a considerable declivity; for if they be too steep, a heavy shower of rain would produce irreparable mischief. To obviate such accidents, they should, if practicable, be directed both north and south, so as to be on a gentle slope; and thus gradually to carry off the water. By such method, crops (the seed of which has been sown on the east and west sides) will be alike exposed to the enlivening rays of the sun, and consequently about the same time attain to maturity. See also Furrow and Ploughing.

RIDING, in general, signifies the act of being carried along in any vehicle, or on the back of an animal.

Riding is one of the most useful species of exercise, particularly to convalescents and invalids; as it tends to clear the intestinal canal, to remove obstructions, to promote digestion, and to facilitate the discharge of crude matters. The most healthy mode of riding, is that on horse-back; but, if a person be weak and exhausted, it will be more advisable to employ a carriage. In all cases, however, the agitation ought to be moderate, one window in the coach being left open, so that respiration may not be impeded or confined.

The most suitable time for this exercise, in the summer, will be the morning, previously to partaking of any food; or about the middle of the day in the spring, autumn, or winter; but it should never exceed the space of one hour, or an hour and a half. Thus, the invigorating influence of the air will beneficially operate on the human system, and greatly contribute to the establishment of health.

RING-BONE, in farriery, denotes a hard swelling on the lower end of the pastern, generally extending half way round the forepart of the horse's leg: it is thus termed, from its resemblance to a *ring*.

This malady frequently arises

from strains, and similar accidents; though, when affecting the hind-pastern, it is often occasioned by forcing young horses too early on their haunches. When the tumefied part is distinctly perceivable round the pastern, without affecting the coffin-joint, it is easily cured. But, if it originate from some strain or defect in this joint; or from a callosity seated under the round ligament that covers it; the cure is generally difficult, and sometimes impracticable; because the disorder is apt to degenerate into a QUITTOR-BONE, and eventually to form an ulcer upon the hoof.

Ring-bones occurring in colts and young horses, frequently disappear, without the aid of any application; and, while the substance remains tolerably sound, *blistering* will, in general, prove a sufficient remedy. But, if the swelling be of long continuance, and has become hard, it may then require both blistering and *firing*. In order to perform this operation with success, the iron employed, should be thinner than that commonly used for such purpose, and the lines or razes, must not be made above one quarter of an inch apart, crossing each other obliquely. A mild blister, extending over the cauterized parts, should next be applied; and, after having produced the desired effect, it will be requisite only to cover them with the common defensive plaster, which will in most cases complete the cure.

RING-WORM, or TETTER, (*Herpes miliaris*), an eruption on the face, which consists of numerous small pustules, that rise closely in contact with each other; appearing generally in a circular form, and being attended with painful itching.

These pustules never suppurate, and cannot be easily cured; often breaking out at certain periods of the year, even after they have been apparently removed. The usual application, in this affection, is the common *black* or *writing-ink*; but frequent friction, or embrocation of the eruption with mushroom *catsup*, has sometimes been attended with success. The following preparation has likewise been recommended; though we have had no experience of its effects: Take the roots of wild or garden sorrel; let them be washed perfectly clean, bruised in a stone mortar, and steeped in strong white-wine vinegar, for two or three days. At the end of that time, the liquor will be fit for use, and the ring-worm should be rubbed with it three or four times in the course of the day, and every night, previously to retiring to rest; the roots being left in the vinegar as long as any of this liquid remains.

RIVER, a current or stream of fresh water, which flows in a bed or channel, from its spring or source, and empties itself into the sea.

Rivers form one of the chief ornaments of the globe; while they serve not only to carry off superfluous rains and springs; but, from the great numbers and varieties of fish they contain, likewise afford a grateful food to mankind. They also greatly tend to fertilize the soils through which they flow; and the MUD, that subsides at the

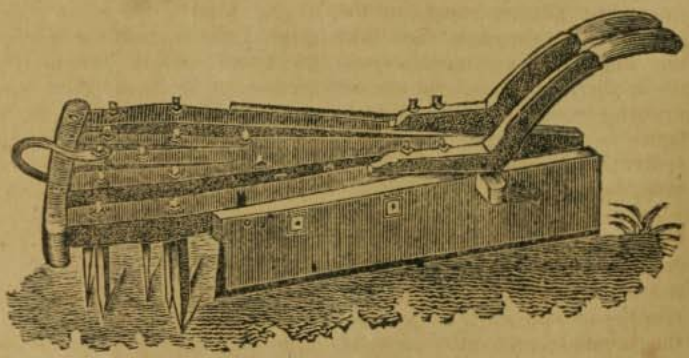
bottom, as well as the weeds which vegetate on their banks, form a valuable fertilizing MANURE.

River-water is much softer, and better adapted to economical purposes, than that obtained from springs.

River-water, however, is more pure and salubrious, after having passed through gravelly or sandy soils, than if it flow over muddy or clayey beds; or glide through forests, or populous villages and towns, where it becomes impregnated with numerous impure vegetable and animal substances. In this turbid state, it is improper for domestic uses, and especially unfit for culinary supply; but, if it be suffered to subside, and be afterwards boiled and filtered, such water will become sufficiently clear and potable...See also ALUM, FILTRATION, and WATER.

ROAD, an open way, or public thoroughfare, which forms a communication between two distant places.

Roads being frequently disfigured, and otherwise injured by the deep *ruts* which are necessarily made by the continual passing and re-passing of narrow wheel-carriages; various machines have been contrived, with a view to facilitate the repairing of highways, and to fill up such excavations.... From these, we shall first communicate the *Road-Harrow*, invented by Mr. HARRIOTT, to whom the *Society for the Encouragement of Arts*, &c. in 1789, voted a reward of ten guineas....As this machine may not only be employed with great advantage, by the surveyors of public roads, but will also be found very serviceable in repairing and improving the private ways, or avenues, belonging to manors, we have annexed the following representation:



The model, from which this cut has been executed, is on the scale of two inches to one foot; so that the head of the harrow is three feet wide from one side of the bar to the other, externally. These bars are four inches square; five feet long; and, to prevent them from being split, they are contrived *lengthwise*, instead of being in a *tranverse* direction. The mould-boards are four feet two inches in

length, ten inches in depth, and two in thickness: they extend 11 inches beyond the bars, in order that the stones (which are brought to the surface by the teeth of the harrow) may be drawn into a smaller compass. These mould-boards are, farther, shod with an iron-bar, and lined with a plate of the same metal, to the height of the spot where they are marked *black*, in the cut above annexed; and such parts of this delineation, as are represented of a deeper colour, distinguish the iron from the wood-work. The teeth are one foot in length from the inferior side of the bars to their points, which ought to be steeled: they are $1\frac{1}{2}$ inch square, and are fixed by means of strong nuts and screws, with collars both on the upper and lower side of such bars.

Mr. HARRIOT'S road-harrow is drawn by two horses abreast: the outside animal is led by a boy on that quarter: while the other horse walks in a proper path, and a man keeps the harrow steady by the handles; consequently they take one inside and one outside quarter in their progress, and the remaining two quarters in their return.

By this excellent machine, a man, boy, and two horses may, with ease repair three miles in length, in one day; harrowing down the quarters, and drawing the stones together, which are dropped into the ruts, by means of the mould-boards, in a more effectual manner than if they were *stubbed in* by a man. Lastly, the work is performed not only more expeditiously, but also at *one-tenth* part of the expence incurred, when the roads are repaired by *manual* labour.

In the 5th volume of the *Repertory of Arts*, &c. we meet with an account of a contrivance for preventing the wheels of carriages from making ruts in roads, by ROBERT BEATSON, Esq. This object is effected by fixing between the other wheels a *protector*, or small roller, or broad wheel: the circumference of its upper part should be about $1\frac{1}{2}$ inch beneath the axle-tree, while the lower one ought to be of a similar distance from the ground. Such roller must be secured to the axle-tree, so as to be able to support the whole weight of the carriage, in case the principal wheels descend into any deep ruts. The size of the protector varies according to the proportions of these wheels; but Mr. B. observes, that two feet in diameter will be sufficient for *single carts*; and that *double carriages*, or waggons, will require it to be rather larger and broader. By thus elevating the roller a little distance above the lower surface of the wheels, the latter will, on good roads, support the weight of the load; and, if the middle or horse-path be firm, they cannot sink into old, or form any new, ruts; because the protector will roll in the middle, and thus afford an easier draught to the cattle. The additional weight of the machine, if it be properly constructed, Mr. BEATSON conceives, will be inconsiderable; when compared with the utility of such contrivance, and the great reduction in the expence both of making and of repairing roads. A more comprehensive account of this invention, the reader will find in the work above cited, where it is farther illustrated with an engraved figure.

ROAN-TREE. See QUICKEN-TREE.

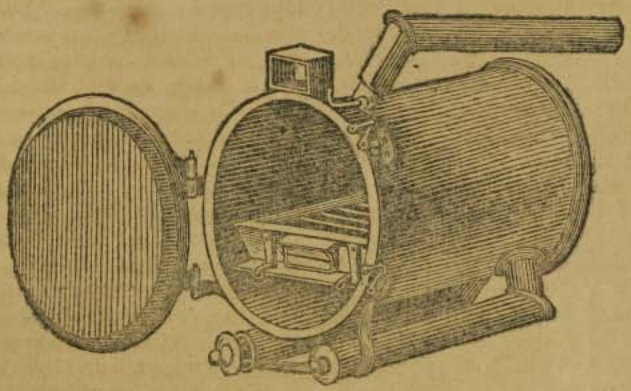
[ROASTER. Having given some account of the improvements of C. RUMFORD, in cooking, under the head KITCHEN, and also, detailed his very useful directions with regard to the management and economy of fire in closed fire-places, we shall now furnish the reader with an account of his contrivances for roasting meat, which promise to be a great convenience. The directions are given at great length, in the 3d vol. of the *Count's Essays*.

"No process of cookery is more troublesome, or attended with a greater waste of fuel, than roasting meat before an open fire. Having had occasion to fit up a large kitchen, for the military academy at Munich, I was led to consider this subject with some attention, and I availed myself of the opportunity which then offered, to make a number of experiments, from which I was enabled to construct a machine for roasting, which upon trial, was found to answer so well, that I thought it deserving of being made known to the public; accordingly, I caused two roasters to be constructed in London, one at the house then occupied by the *Board of Agriculture*, and the other at the *Foundling Hospital*, and a third was put up, in *Dublin*, at the house of the *Dublin Society*. All these were found to answer, and they were often imitated. Meat roasted by this new process, is more delicate, more juicy, and higher flavoured, than when roasted on a spit before an open fire. Many roasters have been put up in the houses of persons of the highest rank; others in the kitchens of artificers, of public schools, taverns, and other houses of public resort, and the use of them has been found to be economical, and advantageous in all respects. The body of the roaster, is a hollow cylinder of sheet iron, which, for a roaster of a moderate size, may be made about 18 inches in diameter, and 24 inches long; closed at one end, and set in an horizontal position in a mass of brick work, in such a manner that the flame of a small fire, made in a closed fire-place directly under it, may play all round it, and heat it equally and expeditiously. The open end of this cylinder, which should be even with the front of the brick-work in which it is set, is closed either with a double door of sheet-iron, or with a door of sheet-iron, covered on the outside with a pannel of wood; and in the cylinder, there is an horizontal shelf, made of a flat plate of sheet iron, supported on ledges rivitted to the inside of the cylinder, on each side of it. This shelf is situated about three inches below the center, or level of the axis of the the roaster, and serves as a support for a dripping pan, in which, or rather *over which*, the meat to be roasted, is placed.

This dripping-pan, is made of sheet-iron, and is about two inches deep, 16 inches wide above, 15½ inches in width below, and 22 inches long; and is placed on four short feet; or what is better, on two long sliders, bent upwards at their extremities, and fastened to the ends of the dripping-pan; forming, together with the dripping-pan, a kind of sledge; the bottom of the pan being raised by these means, about an inch above the horizontal shelf on which it is supported. In order that the pan, on being pushed into, or drawn out of the roaster,

may be made to preserve its direction, two straight grooves are made in the shelf on which it is supported, which, receiving the sliders of the dripping-pan, prevent it from slipping about from side to side.... The front ends of these grooves are seen in figure I, as are also the front ends of the sliders of the dripping-pan, and one of its handles.

Figure I.



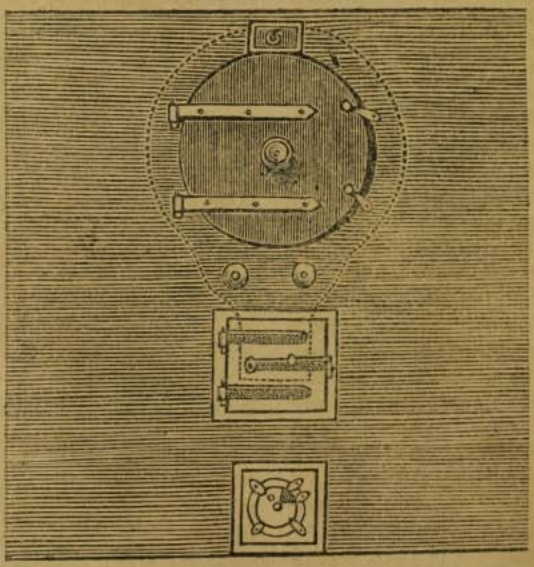
In the dripping-pan, a gridiron is placed, the two bars of which are on a level with the sides or brim of the dripping-pan, and on this gridiron the meat to be roasted is laid; care being taken, that there be always a sufficient quantity of water in the dripping-pan, to cover the whole of its bottom to the height of at least half or three quarters of an inch, for the purpose of receiving the drippings of the meat.

Mr. Frost, of Norwich, places a second shallow pan, made of tin, and standing on four short feet, into the first, and then places the gridiron which is to support the meat, in this second dripping-pan. As the water in the first keeps the second cool, there is no necessity for putting water into this; and the drippings of the meat, may, without danger fall into it. When Yorkshire puddings, or potatoes, are cooked under roasting meat, this arrangement will be found very convenient.

The second dripping-pan must not touch the first, except by the ends of its feet; the bottom of the second must also be clear of the bottom of the first. The lengths and widths of the two pans above, or at their brims, may be equal, and the brim of the second may stand half an inch above the level of the brim of the first. The horizontal level of the upper surface of the gridiron, should not be lower than the level of the brim of the second dripping-pan; and the meat should be so placed on the gridiron, that the drippings from it cannot fail to fall into the pan, and never upon the hot bottom, or sides of the roaster.

To carry off the steam which arises from the water in the dripping-pan, and that which escapes from the meat in roasting, there is a steam tube belonging to the roaster, which is situated at the upper part of the roaster, commonly a little on one side, and near the front of it, to which tube there is a damper so contrived as to be easily regulated without opening the door of the roaster. This steam-tube is distinctly seen in figure I, and the end of the handle by which its damper is moved, may be seen in *Fig.* 2.

Figure II.



The heat of the Roaster is regulated at pleasure, by means of the register in the ash-pit door of its fire place, *Fig.* 2. and by the damper in the canal, by which the smoke goes off into the chimney ; This damper is not represented.

The dryness in the roaster is regulated by the damper of the steam-tube, and also by means of the blow pipes, represented in figures, 1, 2 and 3.

These blow pipes, which lie immediately under the roaster, are two tubes of cast-iron, about $2\frac{1}{2}$ inches in diameter, and 23 inches long, or about one inch shorter than the roaster ; which tubes, by means of elbows at their farther ends, are firmly fixed to the bottom of the roaster, and communicate with the inside of it. The higher ends of these tubes come through the brick work, and and are seen in front of the roaster, being even with its face. These blow pipes have stoppers, by which they are accurately closed ; but when the meat is to be browned, these stoppers are removed, or drawn out a little, and the damper in the steam-tube of the roaster being at the same time opened, a strong current of hot air presses in through the tubes into the roaster, and through the roaster into and thro' the steam tube, carrying and driving away all the moist air and vapour out of the roaster. The hot wind blowing over the meat, causes that appearance and taste, which are peculiar to meat well roasted.

Directions for roasters. 1. The fire place must be made very small, 2. Provision must be made for cleaning the flues when obstructed by soot.

For a roaster 18 inches wide, and 24 inches long, the fire-place should be 7 inches wide, and 9 inches long ; and the side walls of the fire-place should be quite verticle to the height of 6 or 7 inches. The quantity of fuel requisite is incredibly small. A fire place of the above dimensions will contain coals enough to heat the roaster, and many more than will be necessary for keeping it hot when heated.

The soot flues may be 4 or 5 inches square, in the brick work, to introduce a brush like a bottle brush with a long handle ; which openings may be closed with stoppers or fit pieces of brick or stone, and the joinings made good with a little clay. The stoppers may have a small iron ring or handle.

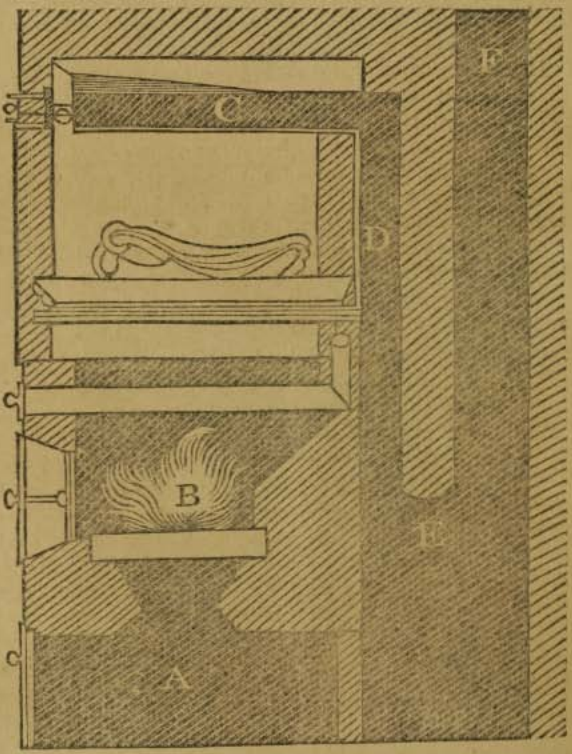
In the figures 2 & 3 a simple contrivance may be seen, for the purpose of removing the soot which is apt to collect about the top of a roaster. By means of an oblong square frame constructed of sheet iron, and fastened to the top of the roaster by rivetts, a door way is opened into the void space left for the flame and smoke between the outside of the roaster, and the hollow arch or vault in which it is placed; and by introducing a brush with a flexible handle through this door way, the soot adhering to the outside of the top of the roaster, and to the surface of the brick work surrounding it, may be detached and made to fall back into the fire place, whence it may be removed with a shovel.

There should always be a passage, or throat of a certain length between the mouth or door of a closed fire-place, and the fire-place properly called, or the cavity occupied by the burning fuel. Where fire-places are of large dimensions, it is very useful to keep this throat constantly filled with coal, which not burning, serves to defend the

door from the heat of the fire; and being well warmed inflames quickly.

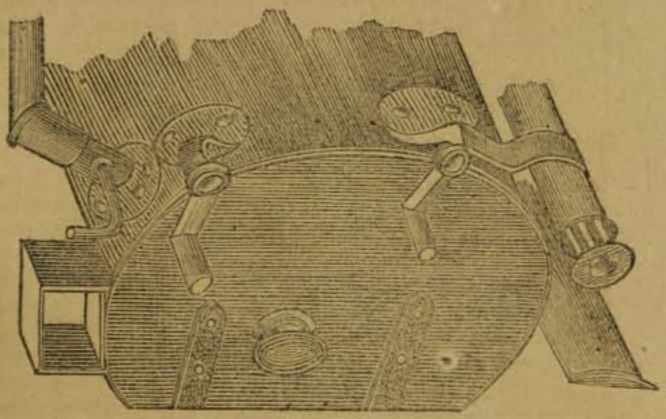
In constructing closed fire places, for roasters, boilers, ovens, &c. I have found it to be a good rule to make the distance between the fire place door, and the hither end of the bars of the grate equal to the width of the fire-place, measured just above the bars. In fire-places of a moderate size, where double doors are used, it will suffice, if the distance from the hinder side of the inner door, to the hither end of the bars, be made equal to the width of a brick, or 4½ inches: but if the door be single, it is necessary that the length of the passage from the door, into the place occupied by the burning fuel, should be at least six or seven inches. *Fig.* 2....Is a front view of a roaster, set in brick-work: and the following cut represents a vertical section of a roaster. The hollow spaces represented in *Fig.* 3, are express-

Figure III.



ed by strong vertical lines, viz. the ash-pit A, the fire place B. The space between the outside of the roaster, and the arch of brick-work which surrounds it, C. The broad canal at the farther end of the roaster, by which the smoke descends, D. And the place E, where it turns, in order to pass upwards into the chimney by the perpendicular canal, F...The brick-work is expressed by fainter lines drawn in the same direction.

Figure IV.



The farther end of the roaster, must be so fixed in the brick-work, that no part of the smoke can find its way from the fire place B, directly into the canal D, otherwise it will not pass up by the sides of of the roaster, to the top of it. At the top of the roaster, at its farther end, an opening must of course be left for the smoke to pass into the descending canal, D. ....The necessity for causing the smoke to descend, has already been mentioned.

If the place where the roaster is set, is not deep enough to allow of the descending canal D, and the canal F, by which the smoke ascends and passes into the chimney, to be situated at the farther end of the roaster, both these canals may, without inconvenience, be placed on one side of the roaster: when this is done, the smoke must be permitted, to pass up behind the farther end of the roaster, as well as by the sides of it.

By taking away a large flat

stone, or a twelve inch tile, placed edgways, a passage from A to E, may be opened occasionally, in order to clean out the canals, D and F, and remove the soot. The steam tube (which is seen in this figure) must open into a seperate canal,(not expressed in the figure,) which must be constructed for the sole purpose of carrying off the steam into the chimney, or into the open air. The steam tube must be laid on a *descent*, to convey off the condensed vapour.

Some care will be necessary in forming the vault which is to cover the roaster above. Its form should be regular, in order that it may be every where at the same distance from the roaster; and its concave surface, should be as even and smooth as possible, in order that there may be the fewer cavities, for the lodgment of soot..... The distance between the outside of the roaster, and the concave surface of the vault, may be about two inches; and the same distance may be preserved below, between the brick-work and the sides of the roaster. In *Fig.* 2. the outline of the fire place, and of the cavity, in which the roaster is set, is indicated by a dotted line.

Directions for the Management of a Roaster.

1. Keep the roaster clean.

2. Prevent the meat from touching the sides, and the gravy from spilling. When grease-spots appear, the inside of the roaster must be washed, first with soap and water, then with pure water, to take away the soap, and wiped *very dry*.

3. The fire must be moderate; about one third more time is required, than to roast in the usual way.

4. The blow-pipes must be closed, from the time the meat goes in, till within 12 or 15 minutes of its being sufficiently done, that is, till it is to be *browned*; which is effected in the following way: the fire is made to burn bright and clear for a few minutes, till the blow-pipes begin to redden; (which may be seen by withdrawing their stoppers for a moment, and looking into them) when the damper of the steam-tube of the roaster being opened, and the stoppers of the blow-pipes drawn out, a *certain quantity* of air is permitted to pass through the heated blow-pipes, into and through the roaster. The quantity of air necessary to be admitted, must depend upon the *trim of the roaster*, which will soon be discovered by the cook.

The damper of the steam-tube must be kept so much opened, that the steam from the meat and water, may not be seen coming out of the roaster, through the crevices of the door.

In brightening the fire, fresh coals must not be put in, but a small faggot of *dry* wood, or a little bundle of dry wood, split into small pieces. Indeed, wood is a preferable fuel to coals, for roasters..... When the door of the roaster is to be opened, the steam-tubes and blow-pipes, must be first opened about a quarter of a minute, to drive away the steam.

To keep meat warm, when done, before it is sent to table; close the

register of the ash-pit door, open the fire-place door, and damper in the chimney ; take out the fire, or cover it with *cold ashes*, and lastly, open the dampers in the steam-tube and blow-pipes. When the heat is moderated sufficiently, the blow-pipes and the damper in the steam-tube may be nearly closed ; and if there be danger of the cooling being carried too far, the fire-place door may be shut.

The door may be made a little dishing, to prevent its warping, and should *never shut into grooves*, but close tight, by causing the flat surface of the inside of the door to lie against, and touch in all parts, the front edge of the door-frame ; which front edge must of course be made perfectly level, and as smooth as possible.

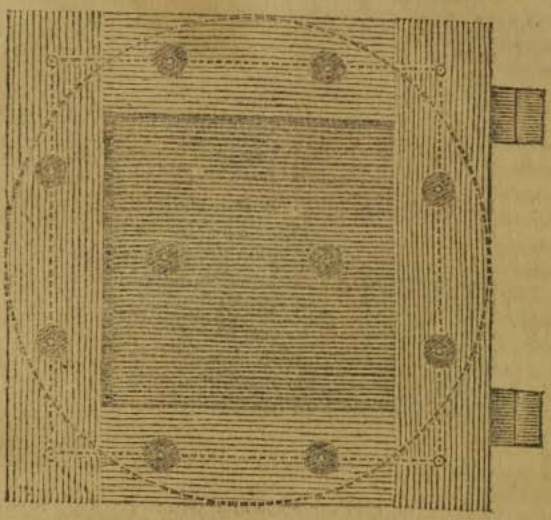
If the front end of the clylinder of sheet-iron, which forms the body of the roaster, be turned outwards over a very stout iron wire, (about one third of an inch in diameter, for instance) this will strengthen the roaster very much, and render it easier to make the end of the roaster level, to receive this flat surface of its door ; it can most easily be made level, by placing the cylinder in a vertical or upright position, with its open end downwards, on a flat anvil, and hammering the wire above-mentionsd, till its front edge, which reposes on the anvil, is quite level.

In order that the roaster may close well, its hinges should be made to project outwards beyond the sides of the roaster; and it should be fastened, not by a common latch, but by two turn-buckles, situated just opposite to the two hinges. The distance at which the two hinges (and consequently the two turn-buckles), should be placed from each other, should be equal to half the diameter of the roaster.

The hooks for the hinges, and also the support for the two turn-buckles, should be situated at the projecting ends of strong iron straps, fastened at one of their ends, to the outside of the roaster, by means of rivetting nails. The manner in which these turn-buckles are constructed, and the manner in which they are fastened to the roaster, may be seen by examining *Fig.* 4. where they are represented.

The door may be constructed of a single sheet of iron, and covered on the outside with a *pannel* of wood, not a board ;....or it may be constructed of two sheets of iron, placed parallel to each other, at the distance of about an inch, and so fastened together that the air between them may be confined.... The manner in which the pannel-door may be made will be evident from an examination of the following figure, which represents a front view of the door of a cylindrical roaster, eighteen inches in diameter, covered with a square wooden pannel.

Figure V.



This pannel consists of a square frame tenanted, and fastened together at each of its four corners with a single pin; and filled up in the middle with a square board or pannel, which is confined in its place, by being made to enter into deep grooves or channels, in the insides of the pieces which form the frame. The circular iron door to which this pannel is fixed, cannot be seen in the figure, being covered and concealed from view by the wood, but its size and position are marked out by a dotted circle; and the heads of ten rivetts are seen, by which the wooden pannel is fastened to the iron door. These rivetts are made to hold the wood fast to the iron, by means of small circular plates of sheet iron, which are distinctly represented in the figure.

The frame of the pannel consists of four pieces of common deal, four inches wide, and one inch thick, fastened with one pin only at each of their joinings at the corners, and these pins being situated in the centre of those joinings, if upon the frame, in the middle of each of the four pieces which compose it, a square be drawn in such a manner that the corners of this square may coincide with the centres of the four pins which hold the frame together, as neither heat nor dryness makes any considerable alteration in the length of the fibres of wood, it is evident that the shrinking of the four pieces which compose this frame, cannot alter the dimensions of this square, or in any way change its position. If, therefore, care be taken in fastening the pannel to the iron door, to place the rivetting-nails in *the lines which form the four sides of this square*, the shrinking of the wood will occasion no strain on the iron

door, nor have any tendency whatever to change its form; and with regard to the centre piece of the pannel, if it be fastened to the iron door by two rivetts, *situated in the direction of the fibres of the wood*, in a line dividing this piece into two equal parts, its shrinking will be attended with no kind of inconvenience. Care must be taken to make this pannel enter so deeply into the grooves in its frame, that when it has shrunk as much as possible, its width shall not be so much reduced as to cause it to come quite out of the grooves..... This piece may be made about one-third of an inch thick; and the grooves which receive it may be made of the same width, and about three quarters of an inch thick.

Cartridge-paper soaked in alum-water, is to be interposed between the iron door and wooden pannel, to prevent the wood being set on fire from the heat of the iron: and each of the two rivets which pass through the centre piece of wood in the door, must also pass through a small block of wood, about an inch thick, which will give these rivets a proper bearing, without any strain on the iron door. The hinges are to be rivetted to the outside surface of the circular iron door, and let into the wood. The turn-buckles must be made to press against the outside or front of the wooden frame.

Of the Blow-pipes.

They should be of cast-iron, with flanches, and keyed on the inside of the roaster; and their joinings with the bottom of the roaster must be made tight with some cement that will stand fire. A small quantity of iron-wire put into the tubes, will increase their effect.

The stoppers must close well; one of these stoppers is seen in *Fig.* 4. and in that figure, part of the iron strap is seen which supports the front ends of the two blow-pipes, and confines them in their places....This strap will not appear when the roaster is set.

Of the Steam-tube.

It should be situated any where in the upper part of the roaster. The simplest damper is a circular plate of iron, a very little less in diameter than the tube, in which it moves on an axis, perpendicular to the axis of the tube. This axis being prolonged, comes forward through the brick-work. See *Fig.* 1, 2, 4.

Of the Dripping-pan.

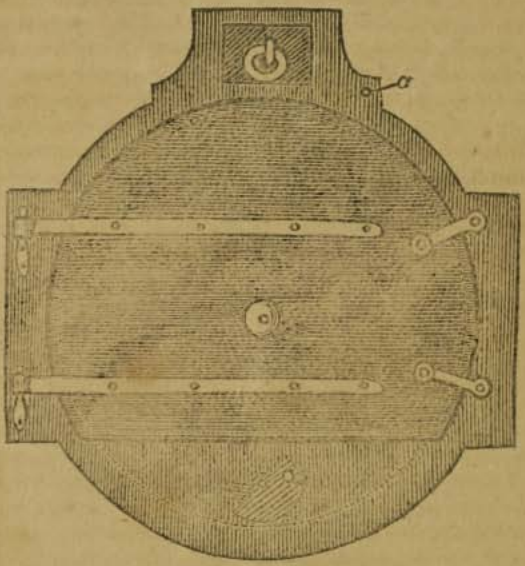
It should be hammered out of *one piece* of sheet-iron; and a little shorter than the roaster; room must be left between the farther end of it, and the farther end of the roaster, for the hot air from the blow-pipes, to pass up into the upper part of the roaster. It should have two falling handles, one at each end, with stops to hold them fast.

To defend the bottom of the roaster from excessive heat, it occurred to me to use a shallow iron pan turned upside down, with a row of holes from side to side at the farther end of it; and this in-

vention was found to answer very well.

ROASTING OVENS.

The following figure represents a front view of a cylindrical roasting-oven, with its door shut. The front end, which constitutes the body of the oven, instead of being turned over a stout wire, is turned outwards, and rivetted to a flat piece of thick sheet-iron, which in this figure is distinguished by vertical lines, and which I shall call the front of the oven.



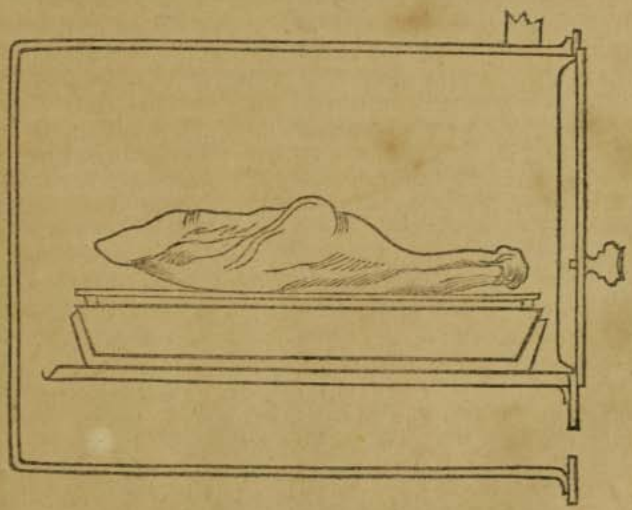
The door of the oven is distinguished by horizontal lines....The general form of the front of the oven is circular; but it has two projections on opposite sides of it, to one of which the hinges of the door, and to the other the turn-buckles for fastening it when closed, are fastened. It has another projection above, which serves as a frame to the door-way, through which a brush is occasionally introduced for the purpose of cleaning the flues. On one side of this projection there is a small hole, which is distinguished by the letter *a*, through which the handle or projecting axis of the circular register of the vent tube, (which is not seen), passes.

In the body of the oven, at the distance of half its semi-diameter

below its centre or axis, there is an horizontal shelf, which is fixed in its place, not by resting on ledges, but by its hither end being turned down, and firmly rivetted to the vertical plate of iron, which I call the front of the oven. This shelf, which should be double, to prevent the heat from passing through it from below, must not reach quite to the farther end of the oven; there must be an opening left, about one inch in width, between the end of it, and the farther end of the oven, through which opening the air heated below the shelf, will make its way into the upper part of the oven.

The hollow space below the shelf, is intended to serve in place of the blow-pipes of a roaster; and this office it will perform tolerably well, provided means are used for admitting cold air into it, occasionally. This is done by means of a register, situated at the lower part of the vertical front of the roaster, a little below the bottom of the door. This register is seen in the above figure.

The following figure represents a vertical section of the oven through its axis, shows the double door of the roaster shut, and the two dripping pans, one within the other, standing on the shelf just described, which is supposed to be laying on a gridiron placed in the second dripping pan. The register of the air chamber, below the shelf, is represented open; and a part of the steam tube is shown, through which the steam and vapour are driven out of the oven, by the blast of hot air from the air chamber.



The cylinder constituting the bottom of the oven is two feet long, and is supposed to be of cast-iron. It is cast with a flanch, which projects outwards, about one inch at the opening of the cylinder, by means of which flanch it is attached, by rivets, to the front of the oven, which, as I have already observed, must be made of strong sheet, iron, near one eighth of an inch in thickness.

The shelf, dripping pan, and double door might easily be made of cast-iron; and in case the shelf to save trouble of rivetting in making it double may be covered by an inverted shallow pan of cast-iron, and in the bottom of this pan, there may be cast two shallow grooves, both in the direction of the length of the pan, and about an inch from the sides, in which grooves, two parallel projections, at a proper distance from each other, cast to the bottom of the lower pan, may pass. These projections passing freely in the grooves which receive them, will serve to keep the dripping pan steady in its proper direction, when it is pushed into or drawn out of the oven.

To increase the effects of the air chamber when this oven is used for roasting meat, a certain quantity of iron wire, in loose coils, or of iron turnings, may be put into the air chamber.

The door of the oven, which is represented in the last figure, above, should be about 19 inches in diameter within, or in the clear. In this figure, the internal edge or corner of the hither end of the oven is indicated by a dotted line, and the position of the shelf is pointed out by an horizontal line.

In fastening the vertical plate which forms the front of the oven, to the projecting flanch at the hither end of the oven, care must be taken to beat down the heads of the rivetting nails in front, otherwise they will prevent the door of the oven from closing it with that nicety which is requisite.

In setting this *roasting oven*, the whole of the thickness of the vertical front, should be made to project forward before the brick-work. The fire-place, doors, ash-pit, register-door, damper in the chimney, &c. should be in all respects similar to those used for roasters; and the flues should likewise be constructed in the same manner.

I have been more particular in my description of this *roasting oven*, because I think it bids fair to become a most useful implement of cookery. As an oven, it certainly has one advantage over all ovens, constructed on the common principles, which must give it a decided superiority; by means of the air chamber and the steam tube, it may be kept clear of all ill-scented and noxious fumes, without the admission of cold air.]

ROE. See ELDER;

ROBIN-RED-BREAST. See RED-BREAST.

ROCK-SALT. See SALT.

ROCKET, or *Brassica Eruca*, L. an exotic species of the cabbage, which was formerly cultivated to a considerable extent in gardens. It is divided into two varieties, known under the names of the *Wild* and *Garden Rocket*. This plant is propagated from seed, which is sown early in the spring: it flowers in the month of June. When used as a principal ingredi-

ent in summer salads, it is, on account of its pungency, always eaten together with endive, purslane, or similar cooling vegetables.

With respect to its medicinal properties, the rocket is aperient, and expels flatulency. Its seeds are remarkably acrid, resembling mustard in flavour; for which spice they have often been used as a substitute. According to BRADLEY, it is an useful vermifuge; and, when boiled, and applied externally, is said to remove spots from the face. BOHMER informs us, that both the seeds and flowers of this herb may, in times of scarcity, be converted into bread.

ROE, in ichthyology, denotes the eggs or spawn of fish.

The roes of male fishes are usually denominated *soft roes*, or *melts*; as those of females are known under the names of *hard roes*, or *spawn*. Both vary in size, according to the fish from which they are obtained. Those of cod, for instance, when pickled, are greatly esteemed at the tables of the luxurious. Such rancid food, however, ought not to be eaten by the invalid, the convalescent, or otherwise debilitated; as, on account of its crude nature, and peculiar acrimony, it is very apt to cause indigestion, with all its numerous evils. But, if the epicure cannot abstain from dishes of this description, he ought to enjoy them with great moderation; to make use of *biscuits* instead of *new bread* (as is usually eaten at his table), and thus, in some degree at least, to correct the oily quality of the *roe*.

....See also CAVIAR.

ROLLER, a well-known implement of agriculture, the cylinder of which consists either of stone, wood, or iron.

The principal design of *rolling* land, is to render loose soils more compact; by which means the earth adheres closely to the roots of plants, and their growth is considerably promoted. The season for performing this operation, varies according to the nature of the soil, and of the vegetables to be raised. Thus, it is an object of considerable importance, to roll wheat in the months of October and November, and from January till April, especially if the ground be loose; because the winter-rains frequently press the soil down, and thus leave the roots uncovered; and the autumnal rolling will prevent the ill effects of frost, [in thowing up the plants out of the ground] as the spring-rolling will obviate those arising from droughts. Farther, it will be necessary to pass the machine over land sown with barley, directly after the seed is scattered. Oats, also, particularly on light soils, should be thus treated immediately after sowing; but, in clay-lands, the operation ought to be deferred till the grain appear above ground. Lastly, all grasses may with advantage be rolled once, early in the spring; and, if it be practicable, a second and even a third time, after irrigation; because the earth will thereby not only be rendered more firm around the roots, but this management will also facilitate the future mowing.

....See PASTURAGE.

ROOM, a chamber, parlour, or other apartment of a house.

The principal object to be attained in the arrangement of rooms, is doubtless, convenience, and their adaptation to health: hence the rectangular square, seems to be best calculated for

this purpose; though a *cube* is not only the most agreeable, but also the most economical, figure. In large houses, however, the particular shape is of less consequence than the height of a room, which should be at the least 10 or 12 feet from the floor; as otherwise it may form a *spacious*, but cannot be considered a proportionate, or *healthy* apartment.

The elevation of rooms greatly depends on their figure. If they be constructed in a regular square, their height should, on architectural principles, not exceed 5-6ths, of the sides, nor be less than 4-5ths; but, in oblong chambers, it may be equal to their breadth. ....A square room of a large size, is so far inconvenient, as the chairs, tables, &c. are too remote from the hand, so that they must be ranged along the sides of the room, when unemployed. Utility, therefore, requires a commodious apartment, to be a *parallelogram*; a figure well adapted for the admission of light....Thus, to avoid cross-lights, all the windows ought to be introduced through one wall; for if the opposite wall (as would be the case in *oblong* rooms) be at such a distance as not to receive sufficient light, the chamber will necessarily be obscure. Hence we may conclude, that utility and beauty, in the construction of substantial dwelling-houses, are with difficulty combined, nay often incompatible.

[The cielings of rooms intended for public speaking, ought to be flat; because, when they have one or more echos, which arise from cupolas, alcoves, vaulted cielings, &c. the repetition of one or more sounds come to the ear at the same time, that another direct sound reaches it, which not only spoiles the former, but very frequently forms a discord.]

A patent was granted in December, 1783, to Mr. Joseph Green, for a method of communicating warmth to rooms, and buildings, by means of heated air, supposed to be much purer than any that was hitherto been contrived.....For this purpose, the patentee employs a boiler, made of iron, copper, &c. within which is fixed one or more hollow vessels, or worms. The former vessel may be placed in any chamber, behind a stove or grate, so as to partake of a common fire; its size may be regulated by the extent of the apartment, or other place intended to be warmed; the steam is conducted in pipes, disposed in the most convenient manner, to the different rooms or other parts of the building. But, as this patent is not yet expired, the curious reader is referred to the 1st vol. of the *Repertory of Arts*, &c. where the whole process is minutely described..... See also Air.

ROOT, in botany, denotes that part of a plant, which imbibes the nutritious juices from the earth, and conveys them to the stem, leaves, blossoms, and fruit.

Botanists have divided roots into three classes, according to their shape or figure, their situation in the ground, and their duration.

I. With respect to figure, roots are either *simple*; *spindle-shaped*, as in the carrot; *bitten off*, as in the devil's-bit scabius; *bulbous* (See Bulb, vol. i. p. 435), *tuberous*, as in the potatoe; *beaded*; *branched*; *hair-like*; *jointed*; *scaly*; *pendant*; *toothed*; *fasciculated*, or *bundled*.

II. The roots, which are de-

nominated from their SITUATION, are either *perpendicular; horizontal; oblique; creeping; zig-zag*, or *inflected;* or such as put forth *suckers*.

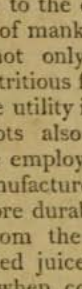
III. With regard to their DURATION, roots are either *annual*, that is, they flower and decay in one year; *biennial*, when they continue to vegetate two years; and *perennial* roots, are such as flourish for several, or at least more than two, years.

These essential parts of plants greatly contribute to the comfort, and to the benefit of mankind; as many of them not only afford wholesome and nutritious food, but are of considerable utility in medicine. Several roots also impart colours, which are employed both in arts and in manufactures; and are, in general, more durable than those obtained from the plants. Thus, the expressed juice of the common radish, when combined with tobacco-pipe clay and a little alum, yields a blue of considerable permanency and brightness.

Notwithstanding their tinging properties, however, the generality of roots is *etiolated*, or perfectly white, in consequence of their seclusion from the light. This phenomenon, in the opinion of Dr. DARWIN, arises from the liberation or evolution of their superfluous oxygen, which unites with the colouring matter, and converts the latter into a colourless acid; excepting in such roots as contain too large a proportion of the dyeing substance, for instance, in the madder; the roots of which, externally, are red, while the internal part is yellow.....See also LIGHT.

ROOT of SCARCITY. See MANGEL-WURZEL.

ROOT-STEAMER, an useful machine, employed in America, for steaming potatoes, carrots, and other roots, with the view of feeding cattle: and which, for the simplicity of its contrivance, and the facility with which vegetables may thus be prepared, deserves to be more generally known in Britain. We have therefore subjoined the following representation:



The apparatus here delineated, consists of a brick-stove, in which a pot or kettle is fixed: over this boiler is placed a hogshead or cask, the top of which is open (we believe it might with more advantage be covered with a coarse cloth); while the bottom is drilled with numerous holes, about one inch in diameter; so that the steam may freely pass through the roots. In this vessel, the potatoes, &c. after being washed, are deposited; and when sufficiently steamed, they afford a more invigorating and fattening food to cattle, than in a raw state.

ROPE, a continuation of several twists or strings of hemp, combined by means of a wheel, and in that state employed in various

branches of naval, military, and civil architecture, as well as in rural and domestic economy.

Ropes may be manufactured of all vegetable substances that are sufficiently fibrous, tenacious, and pliant. Thus, the stems of aloes, the fibrous covering of cocoa-nuts, bamboos, and the leaves of the common Spanish nut-grass (*Lygeum spartum*, L.), are, in the East-Indies, advantageously converted into ropes. The barks of the Linden-tree, Willow, Bramble, &c. are employed for the same purpose in Europe but the most durable and flexable materials hitherto discovered, are flax and hemp, the latter of which is preferred for all cordage employed for raising great weights.

From the multifarious purposes to which ropes are subservient their manufacture is an object of considerable importance: our limits, however, permit us only to mention such patents as have been obtained for making or working them to the greatest advantage, and which have not already been stated, under the article Cord.

In March, 1793, a patent was granted to Mr. John Daniel Belfour, for a new invented machine in the manufacture of ropes and cordage. The object of this contrivance, is the improvement of the common method, by making every *yarn* bear an equal proportion of the strain or weight: for this purpose, each yarn is wound on a separate reel, which is so constructed as not to yield, or part with the former, till it is unwound in its rotation, with a view to contribute its proportionate assistance in forming the *strand*.... As the construction of this machine is interesting chiefly to rope-makers, we forbear to describe it, and refer the inquisitive reader to the 2d vol. of the *Repertory of Arts*, &c. where a full specification is given, and illustrated with an engraving.

In November, 1798, another patent was obtained by Mr. John Curr; for a method of manufacturing *flat ropes*, to be used in drawing coals, water, &c. from any mine or pit. Such ropes may be made, by connecting two or more cords or small ropes *sidewise*, by sewing or interweaving them with thread, or cordage made of hemp, flax or other materials; or with brass or iron wire; so as to prevent them from separating, and to form a broad rope. The patentee observes, that this sewing or stiching may be effected in different ways; and that his machine will be found eminently useful, and expeditious; but, as a mere description will not convey an adequate idea of its mechanism, the reader will consult the 10th volume of the work above quoted; in which it is fully described, and exemplified by a plate.

A method of making ropes more durable, than may be effected on the usual plan, has lately been discovered at Wurtemberg. It consists simply in combining the threads in a parallel direction; and experiments have demonstrated, that such a rope woven of 504 threads worked together, will support 13 cwt. without breaking. This contexture being there, 3-16th inches in diameter, and 111 feet in length, did not exceed 19lbs. in weight; while a common rope

of similar dimensions weighed 31½ lbs.

ROSE, St. Anthony's Fire, or *Erysipelas*, is an inflammation and swelling of the skin, which disappear upon pressure, but suddenly return; being attended with an ardent fever, the principal symptoms of which are drowsiness, and sometimes delirium. It frequently attacks the face, though other parts are not exempt from its influence.

This eruptive disorder is very apt to change its place on the human body. In its progress, the redness extends over the contiguous parts, and usually vanishes from those previously affected.... The inflammation, however, does not produce any remission of the fever, which, in some instances, even increases during the progressive eruption; and, in general, continues for eight or ten days.... When the inflammatory symptoms have prevailed for some time, vesicles of various sizes, containing a thin yellowish liquor, are usually observed to arise on different parts. Though the surface of the skin, thus blistered, sometimes assumes a livid hue, this circumstance is by no means alarming. On the contrary, the sound surface of the skin, scales off towards the end of the disease. If no delirium, or other affection of the brain intervene, the event is generally favourable; but persons, who have once been attacked with the *Rose*, are liable to frequent returns, especially in the spring and autumn.

Causes:...Violent passions; irregular secretion of the bile; suppression of habitual evacuations, such as piles and bleedings; external injuries; acrid and coarse food, difficult of digestion, &c.

Hence, we recommend to persons who are pre-disposed to this affection, a rigid abstinence from fat and viscid provisions, particularly pickled, dried, and high-seasoned dishes: they should adopt a cooling, light, and vegetable diet, their beverage consisting of a mild white wine; the good effects of which will be greatly promoted by moderate exercise, and taking one or two drams of cream of tartar in a glass of water, every night, on retiring to rest.

Cure:....The principal attention must be directed to the inflammatory stage of the disorder. It will, therefore, be indispensably necessary to refrain from all animal food, spirituous liquors, &c....In the begining of the complaint, copious decoctions of dried elder-flowers, with a few grains of nitre dissolved in the liquor, will be of great service; beside which, the bowels ought to be opened by mild, cooling laxatives. If, in the progress of the disease, a foul stomach should be observed, without excessive febrile heat, an emeitc may be taken with advantage...Blood-letting must not be attempted without due precaution; as it will be proper only in cases where the brain is affected by the fever. But, if the disease be attended with general debility, bark and wine must be immediately and freely administered. Should, nevertheless, symptoms of mortification appear, the treatment, stated under the article Gangrene, will be generally found effectual, in checking its progress. Having, on many occasions, witnessed the bad effects of moist or

unctuous applications, in the *true Rose* (tho' KIRKLAND and others have indiscriminately recommended them), we cannot omit this opportunity of cautioning the reader against such practices. According to our experience, *dry* and *warmed wheaten flour*, often strewed on the parts affected, or thin linen bags, stuffed with equal parts of oatmeal and chamomile flowers, together with a few drams of coarsely pounded camphor, have uniformly been attended with the desired effect. These external remedies contribute to relieve the tension, and inflammatory state of the skin, while they allay irritation, and, in a manner absorb the exhaling noxious matter; whereas, lotions and unguents of every description, only aggravate the disorder, by clogging the pores, and exciting a degree of re-action; which cannot fail to be hurtful, especially when accompanied with the slightest friction, either of the fingers, or even a piece of cloth.

ROSE, or *Rosa*, L. a genus of shrubs, consisting of 25, but, according to some botanists, of 90, species, of which the following are the principal, though the first five only are indigenous, namely:

1. The *canina*. See DOG-ROSE.

2. The *spinosissima*, *v. pimpinellifolia*, BURNET ROSE, PIMPERNEL, or SCOTCH ROSE, grows on heaths, in thickets, hedges, and the borders of fields, in sandy situations: it flowers in the month of June or July....This species, on account of its low growth, and the singular beauty of its diminutive leaves, which resemble the Upland Burnet, deserves to be cultivated in every garden. Its ripe fruit is eaten by children, and has a grateful, sub-acid taste. The juice, if diluted with water, dyes silk and muslin of a peach-colour; and, with the addition of alum, it imparts a deep violet; but it has very little effect either on wood or on linen....See also TEA.

3. The *arvensis*, WHITE-FLOWERED DOG-ROSE, or CORN ROSE, is found in hedges and heaths, particularly in the west of Yorkshire. It grows to the height of five or six feet, and has whitish blossoms, armed with prickles bowed downwards: the former appear in July, and are succeeded by red berries; the beauty and fragrance of which have introduced it into our gardens.

4. The *villosa*, or APPLE-ROSE, grows six or eight feet high, in mountainous hedges and shady places, being very common in the north of England. Its large single red flowers blow in the month of June, and are succeeded by round prickly *hips*. In a cultivated state, this species often attains the height of ten feet, and its fruit the size of crabs: hence it deserves a place in every large garden, both for the singular beauty and also for the utility of its berries; which has an agreeable acid pulp, that forms a proper ingredient in sweet-meats.

5. The *rubiginosa*, SWEET-BRIAR, or EGLANTINE, abounds in hedges, where it is often five or six feet high: its small red flowers appear in the month of June and July. There are numerous varieties of this species, the principal of which are known under the names of Common Single-flowered, Semi-double flowered, Blush-double flowered, and Yellow-flowered Roses. The Sweet Briar is generally cultivated in gardens,

chiefly in the borders of walks, and contiguously to dwelling-houses; where its fragrant leaves diffuse a grateful odour.

6. The *Gallica*, or FRENCH ROSE, an exotic species, which is commonly raised in Britain, on account of its beautiful red flowers. It has almost endless varieties, the enumeration of which would swell this article to a disproportionate length. We shall therefore only state the following, viz. the Common Red Rose, with large, spreading, half double, deep-red flowers. The *Rosa mundi*, or Rose of the World, which has large expanding semi-double red flowers, beautifully variegated with white streaks. The York and Lancaster Rose grows to the height of from six to eight feet; and has elegantly striped white and red flowers. The Monthly Rose is from four to six feet high, with green prickly shoots producing numerous party-coloured flowers from May to August, and a second time, if the season be mild, from September or October to December.

7. The *centifolia*, HUNDRED-LEAVED or DAMASK ROSE, is justly termed the *Queen of Flowers*, and has long been an ornament to British gardens, both for its elegance and fragrance. There are several varieties, known under the names of the Province, Royal, Common Dutch Hundred-leaved, Blush Hundred-leaved Roses, &c. The damask rose yields, on distillation, a small portion of butyrous oil, together with a water, which possesses the odour and taste of the roses, and are greatly esteemed for the agreeable flavour they impart to culinary preparations, and also to cordials. They are strongly recommended by HOFFMAN, as being singularly efficacious in exciting the strength, invigorating the spirits, and mitigating pain. Beside these properties, a decoction of its leaves, after being distilled, has a mildly purgative quality; and which, on mixing it with sugar, forms an agreeable laxative syrup, and may with advantage be given to children.

[Moss Roses are deservedly much admired, and may be easily propagatad, by inclosing a branch in a flower pot previously divided, filling it with materials for a hot bed, and tyeing it together round the branch. The roots will strike in the garden pot, and after some months, may be cut off, and planted in the ground, and thus produce a new tree. The pot must be supported by stakes while inclosing the branch.

To cure Roses for preservation... Pick Damask Roses early in the morning, pull off the petals, strew some common salt on the bottom of the vessel, on which sprinkle some roses, add more salt, then another layer of roses, and so on till the roses are all packed..... About one quart of salt will suffice for two pounds of roses. When thus preserved, and well packed in a tight vessel, roses may be preserved for years. The white rose is not worth preserving.]

All the species of roses are hardy, deciduous shrubs, and thrive in any soil or situation; though they flourish best in moist open lands. They are easily propagated by suckers and layers; which, when planted, require only occasional pruning of their dead and superfluous branches, as well as the removal of their suckers, every autumn.

OTTAR, or ESSENCE of ROSES

is a valuable perfume, obtained from these flowers by distillation; it may be prepared in the following manner: Let a quantity of fresh roses be put into a still, with their flower-cups entire, together with one-third of their weight of pure water. The mass is now to be mixed with the hand, and a gentle fire kindled beneath. When the water becomes hot, all the interstices must be well luted, and cold water placed on the refrigeratory at the top. As soon as the distilled water *comes over*, the heat should be gradually diminished, till a sufficient quantity of the *first runnings* be drawn off. Fresh water is then to be added, which should be equal in weight to the flowers, when the latter were first submitted to the still; and the same process repeated, till a due proportion of *second runnings* be procured. The distilled water must next be poured into shallow earthen, or tin vessels, and exposed to the air till the succeeding morning, when the ottar or essence will appear congealed on the surface. The latter is now to be carefully skimmed, poured into phials, and the water, strained from the lees, should be employed for fresh distillation; the dregs however, ought to be preserved, as they contain an equal degree of perfume with the essence.

Such is the process followed in India, where this costly drug is frequently adulterated, by distilling the raspings of sandal-wood with the flowers; but the fraud may be easily detected by the smell, and also by the fluidity of the oil of sandal; which will not congeal on exposure to the air. The true *ottar of roses* is sold in the East Indies at the exorbitant price of *twenty guineas*, and upwards, *per ounce*. It is doubtless the most elegant perfume in vegetable nature; as a single drop imparts its fragrance throughout the room or dwelling, and suppresses other less agreeable odours. Lastly, there is a conserve, syrup, and vinegar of roses prepared in the shops; though the first two only are generally sold.

ROSE-BAY, or *Nerium*, L. a genus of exotic plants, consisting of five species, the most remarkable of which are the following, viz.

1. The *Oleander*, or South Sea Rose, a beautiful shrub, cultivated in gardens on account of its fine purple flowers; it is propagated by planting layers in rich, moist situations. We cannot, however, recommend its culture; as the whole plant, is poisonous, and especially the roots. Its juice, if inadvertently swallowed, excites so great an inflammation as immediately to prevent deglutition; while it operates most powerfully as an emetic and purgative. Farther, the odour of the flowers, if they be handled or kept in close apartments, is attended with injurious effects; as it gradually excites numbness and acute pain in the head. The proper antidotes are copious draughts of vinegar, and other vegetable acids.

2. The *anti-dysentericum*, a native of Ceylon, which is not cultivated. The bark of its root, when grated and infused in water, is said to be of great service in the dysentery.

3. The *tinctorium*, or Dyer's Rose-bay, is a native of Madras, in the East Indies. It has beautiful blue flowers; and a decoction of the leaves, together with the addition of lime, produces a very fine indigo.

ROSEMARY, or *Rosmarinus officinalis*, L. an exotic plant, consisting of two varieties:

1. The *angustifolia*, or Narrow-leaved Rosemary; and,

2. The *latifolia*, or Broad-leaved Rosemary.

Both these species are natives of the warmer climates of Europe, where they flourish on dry rocky soils, contiguous to the sea; and are also cultivated, on account of their medicinal properties, in the gardens of Britain; the climate of which they endure, provided they be planted on poor, dry, and gravelly lands. They may be propagated either by cuttings, or by slips.

Rosemary possesses a fragrant odour, together with a pungent and somewhat bitter taste, resembling that of lavender. The leaves and young tops are the strongest; and from both, as well as the flowers, an essential oil is prepared; or, when distilled with spirit of wine, they afford the celebrated *Hungary water*. These liquid medicines are esteemed excellent cephalics in nervous and hysterical affections; and have been found eminently serviceable in apoplexies, palsies, and vertigoes; in which cases they are sparingly applied to the temples and forehead. According to some writers, they also afford considerable relief to persons troubled with a fetid breath, when employed in gargarisms and dentifrices, diluted with old or long kept spirit of scurvy-grass; while they are supposed to improve the organs of sight.

ROSE-WORT, the YELLOW, or ROSE-ROOT, *Rhodiola communis v. rosea*, L. an indigenous plant, which grows on rocks, and in mountainous situations: it flowers in the months of June and July.....The perennial root of this herb is white, juicy, and possesses the fragrance of roses in so remarkable a degree, as to perfume the atmosphere, especially in Lapland. Its rosy odour is preserved in a dry state: hence it may be usefully employed for distilled waters. The Greenlanders eat the fresh root among culinary vegetables; but, when cultivated in a garden, its odoriferous properties are greatly diminished....The plant is relished by goats and sheep, but rejected by cows and hogs.

ROT, a very fatal disorder, which exclusively affects sheep. It is known by the dullness of the animal's eyes; the livid hue of the gums; foulness of the teeth; the ill scent of the breath; and the facility with which the wool, and, in the last stage, the horns may be pulled out, or separated from their roots.

Various causes have been assigned for the origin of this malady; but the prevailing opinion appears to be, that it arises from the feeding of sheep in too moist or wet lands: though it is certain, that the dry limed land in Derbyshire will produce the rot, as well as watery meadows and stagnant marshes. The anonymous author of the *Farmer's Calendar*, conjectures that it is occasioned by a peculiar species of dropsy, incident to deer, rabbits, and sheep, which, however, originates from superabundant moisture. An ingenious correspondent, in the first vol. of the *Letters and Papers of the Bath and West of England Society*, attributes it to the FLUKWORMS that breed in the livers of sheep, whither they are conveyed through the nostrils, while the animals are

grazing. Lastly, Dr. Darwin suspects the rot to proceed from the inactivity of the absorbent vessels of the livers in sheep, so that the bile becomes too thin or diluted, especially in moist seasons.

Such diversity of opinion is not easily reconciled; but, as the general *fire-disposing* causes obviously consist in too moist food, or damp and wet situations, it follows that *moisture* may be considered as the principal source of the rot.

The remedies contrived for the prevention and cure of this distemper, are as various as the conjectures, respecting its origin. Miller recommends parsley, as being eminently serviceable.....Mr. Price (in the vol. of the *Letters and Papers*, &c. above quoted) recommends every farmer to remove his sheep, in wet and warm seasons, from such lands as are liable to occasion the rot; but, if this be impracticable, he prescribes a spoonful of common salt for each, together with a similar quantity of flour, in a pint of water, once or twice in the week, by way of preventive: and, if the disorder be in an incipient state, a similar dose administered four or five successive mornings, will, in his opinion, probably effect a cure; as the addition of the flour and water not only abates the pungency of the salt, but also disposes it to mix more gradually, though at the same time more efficaciously, with the chyle. Dr. Darwin, however, thinks the salt would be more serviceable, if it were combined into a ball with about sixty grains of iron filings, by means of flour, and introduced into the sheep's throat every morning, for one week.

The following remedy we state on the authority of the *Gentleman's Magazine*, vol. 36, for 1766:....Put a handful of rue into a pail of water, over-night; and, in the morning, add such a proportion of salt as will make a brine sufficiently strong to support an egg. Half a pint of this liquor must be swallowed by each sheep, three times, in the course of six days; that is, every 48 hours one dose.

In October, 1794, a patent was granted to Mr. Thomas Fleet, for a medicine which is affirmed to prevent the rot in sheep, and also to check the farther progress of the disease in animals already infected; so as to render them capable of being fattened on the same herbage which produced the distemper. His *restorative* consists of turpentine, Armenian bole, turmeric, mercury, salt, sulphur, opium, alkanet-root, bark, camphor, antimony and distilled water. These ingredients are to be prepared "according to chemical, and compounded according to medical art." ....Although the patentee has not deemed proper to inform the public of the proportions employed in compounding these multifarious ingredients, yet it deserves to be remarked, that in such a mass of different drugs, the principal effects will be produced by a *few*, while the others are added only with a view to disguise those, which are more efficacious. Hence we believe, that a few grains of muriated quicksilver, combined with camphor, and opium, if judiciously administered, would answer a similar purpose; but in order to convince those readers who wish to purchase Mr. Fleet's preparation, that we are not prejudiced against *Quack or Patent Medicines for Cattle*, it may be useful to add, that the "Restorative for the Rot

in Sheep," is prepared by W. H. THOMAS, surgeon, Basingstoke, Hants; and, we understand, is sold by him, as well as by W. MOORE and Co. No. 80, Fleet-street, London, at 5*s*. 6*d*. per bottle, with printed directions for its use.

ROTTEN-STONE, a fossil obtained from the mines of Derbyshire: which is of an ash-brown colour, moderately hard, and stains the fingers. It does not effervesce with aqua-fortis; but breaks easily in the mouth, or in water.....This mineral is used by lapidaries and other mechanics, for grinding, polishing, and sometimes for cutting stones.

ROWEL, in farriery, signifies a kind of issue, artificially formed in horses, with a view to drain superfluous humours.

Rowels are introduced into the abdomen, the inside of the thighs, the breast, and outside of the shoulders and hips of a horse. The operation is performed by an incision through the skin, about 3-8ths of an inch in length, then separating it from the flesh with the finger, or passing an ivory folder around the orifice: next, a thin piece of leather, of a circular shape, about the size of a silver crown-piece, should be provided, and a large round hole made in its centre. Before the leather is introduced between the skin and muscles, it must be partially covered with lint or tow, and immersed in some digestive ointment: a pledget of tow is likewise dipped in a similar unguent, and carefully put into the orifice, so as completely to exclude atmospheric air. The parts around it soon swell; a copious discharge of yellow serum or water follows; and, in two or three days, at the farthest, the matter will appear thick, gross, and white, when the rowel is said to *suppurate*.

Although these issues are doubtless of great service in some cases, yet, like many other operations injudiciously practised on horses, they sometimes injure their constitution; and, instead of suppurating, become *gangrenous*.

Rowels are eminently useful in carrying off rheums or defluxions from the eyes; in great swellings of the glands, about the throat and jaws, which sometimes threaten suffocation. In the vertigo or staggers, apoplexy, and in large tumors arising suddenly on the legs, heels, &c. when attended with a discharge of thin ichorous matter; as well as in a variety of other disorders, the application of this remedy should be determined by the Veterinary Surgeon....See SETONS.

RUBY, a genus of precious stones, which display a variety of shades, and are divided into four classes: namely,

1. The *deep-red* ruby, is found in various parts of the East-Indies and also in Brazil.

2. The *spinell*, the shade of which resembles that of a bright corn-poppy flower: it is dug out of the mines of Hungary, Bohemia, Silesia, and South America.

3. The *balass*, or pale-red ruby, inclining to a violet, is supposed to be the mother of the different species of these gems. It is imported principally from Brazil, though a few are sometimes brought from the East-Indies.

4. The *rubicell* is of a reddish-yellow, and is likewise obtained from the Brazils....There is a variety of this gem found, in considerable numbers, on the sea-shore, near Ely, in the county of Fife; also near Portsoy, Banffshire, and

at Inverary, Argyleshire, in Scotland.

Rubies are held in great esteem, on account of their lustre, and the beauty of their *water*: hence they are sold at high prices, and often counterfeited by Brazilian topazes, which are gradually heated in a crucible previously filled with ashes, till they become red-hot.

Rubies, when imported, are subject to no restrictions of entry, registry, &c. as they pay no duty whatever.

RUE, or *ruta*, L. a genus of exotic plants, comprising seven species, the principal of which is the *graveolens*, or Common broad-leaved Garden Rue. It flowers in the month of June.

This plant is, for its medicinal properties, often cultivated in gardens. It has a strong odour, and a bitterish pungent taste. The leaves are very acrid; and, when in full vigour, are apt to raise blisters on handling, or applying them to the skin. BOERHAAVE recommends them as powerful stimulants, attenuants, and detergents: hence they are reputed to be of great service to persons of cold, phlegmatic habits; as they quicken the circulation; dissolve viscid or tenacious juices; remove obstructions; and promote the fluid secretions. "What medicine," says he, "can be more efficacious for promoting sweat and perspiration; for the cure of the hysteric passion, of epilepsies; and for expelling poison?"....Nevertheless, the *rue* has lately been seldom prescribed, probably because many absurd and superstitious notions prevail respecting this herb, in domestic life.

RUE, the MEADOW, or *Thalictrum*, L. a genus of plants, comprising twenty-three species, four of which only are indigenous: the principal of these, is the *flavum*, Common Meadow-rue, Spurious Rhubarb, or Rue-weed: it is perennial, grows in moist meadows, pastures, and on the banks of rivers; where it flowers in the month of June.

The root, branches, and leaves of this plant, impart to wool a yellow colour; which, on adding sal-ammoniac, assumes a pale shade; and, on dropping oil of tartar into the decoction, acquires an orange colour; but, in order to give it lustre, the cloth should be immersed in alum-water; and the tint itself may be fixed, by dissolving cream of tartar in the last liquor. A cataplasm prepared of the leaves, is said to have afforded relief in the *Sciatica*; See RHEUMATISM..... From the yellow flowers, bees extract a large portion of honey..... Cows, horses, goats, and sheep, eat the Meadow-rue; but it is disliked by hogs.

RUFF, or *Tringa pugnax*, L. a bird of passage, frequenting the fens of Lincolnshire, and various other parts of Britain, early in the spring; and disappearing about Michaelmas.

Towards the latter end of March, or early in April, Ruffs, for a short time, visit Martin Mere, in Lancashire; where they are taken in clap-nets, to the number of 40 or 50 dozen in a season; and fattened for the table: the food commonly employed, is bread and milk, hemp-seed, boiled wheat, and sugar: thus, in about a fortnight they become extremely fat; and are generally sold at 2s. and 2s. 6d. each. Being of an irascible disposition, it is erroneously supposed these birds must be fed in dark places; lest, on the admission of

light, they should destroy each other by combat.

Ruffs are dressed for the table, with their intestines, like snipes; and, when killed at the critical time, are by epicures considered the most delicious of morsels.

RUM, a spiritous liquor which is distilled from sugar-canes.

The best state in which rum can be imported or preserved, is that of rectified spirit; as it may thus be conveyed in one half of its usual compass, and afterwards reduced to the proper degree of *proof strength*, by means of spring-water. It would, likewise, in this state be better calculated for punch, both on account of its finer flavour, and because the strength of the mixture may be then more uniformly regulated. Farther, fraudulent persons would now be prevented from adulterating it with *malt spirits*, and also from *dulcifying* or sweetening it with oil of vitriol, and similar pernicious drugs.

Such stimulating liquors are in no case absolutely salubrious, and ought to be resorted to only as *medicines*.....See ARRACK, BRANDY, and GIN.

RUNNING-THRUSH. See FRUSH.

RUNNET. See RENNET.

RUPTURE, or a partial protrusion of an intestine, is one of those complaints which has lately become so general, especially among the labouring classes, as to induce benevolent persons in the British metropolis to institute a society for the relief of the unfortunate poor afflicted with this malady, under the direction of Mr. TURNBULL.

The places in which ruptures generally appear, are the groin, scrotum, upper and anterior part of the thigh, the navel, and between the abdominal muscles. The tumor most frequently consists of a portion either of the intestinal canal, or of the omentum (known by the name of *caul*) or sometimes even of both; though instances have occurred of the liver, stomach, spleen, bladder, &c. having formed the contents. From the nature and situation of parts, the different species are distinguished and named: thus, a rupture is called *inguinal*, when situated in the groin; but, when proceeding down to the scrotum, which is often the case, it receives the appellation of *scrotal*; when occurring on the thigh, it is termed *femoral*; and, when the navel is the part affected, *umbilical*. The size of the sac varies according to the stage of the disorder: at the beginning it appears small, but by degrees increases.

Symptoms:.....An elastic white swelling, attended with pain, which becomes more violent on every exertion; nausea; vomiting; and obstruction of the bowels. When the tumor is produced by a portion of the gut, without containing any feces, the surface will be found smooth or equal; and, if compressed, quickly resumes its former size on removing the finger. On the contrary, when hard feces are contained in an intestinal rupture of long standing, they will be obvious from considerable inequalities..... Should a portion, both of intestine and caul, be included in the sac, it will then be unequal and soft; but, if arising from the caul alone, there will be no obstruction of the bowels.

The *inguinal* rupture begins in the groin, and gradually descends into the scrotum, or into the labia vaginæ. The *femoral* hernia occurs more frequently in women; and is

often mistaken for the former: hence it is necessary to observe, that the tumor in the latter is deeper; and that the ring of the abdominal muscles, which in this case lies above the swelling, in that of the inguinal kind, entirely surrounds the diseased part.

The event of this malady depends on the nature of the substance included. If the protruded parts be not timely reduced, the most fatal consequences, such as stricture, inflammation, and mortification, may be apprehended; though the portion of intestine, thus strangulated, be inconsiderable; but, if the caul alone be propelled, it is seldom attended with danger; because this membrane is not of such importance in the animal economy as the viscera and intestines.

Causes:....As ruptures uniformly take place in consequence of local debility, it follows, that whatever may have such effect, will also occasion a protrusion of parts from their natural situation; for instance, all violent bodily exercise, singing, crying, lifting heavy burthens, quick and sudden motions, leaping, falling, &c. every forcible compression of the abdominal viscera by too narrow garments, such as stays, or waistbands. Hence soldiers, singers, dancers, porters, and women of difficult parturition, are very subject to this malady.....In children, it often proceeds from crying, obstruction of the bowels, flatulence, and the neglect of nurses. It has also been remarked, that the inhabitants of those countries where *oil* forms a considerable article of diet, are exceedingly liable to ruptures.

Cure:....The first object should be to reduce the protruded parts, before a strangulation takes place. For this purpose, the patient must be laid on his back; the head being low, and the breech elevated by pillows. [Ice must then be applied to the part, which will tend to contract its size, and thereby promote its reduction. The bowels must also be opened by oily injections, and purgatives administered.] After having persevered in these applications for some time, attempts should be made to reduce the tumor by gentle pressure; and, if this prove ineffectual, greater force must be used, yet so that the operator, while he presses with the palm of his hand, may re-conduct the projecting part with his fingers, through the same aperture through which it had been protruded closely following its natural direction. Thus, if the hernia be in the groin or scrotum, the pressure must be made obliquely upwards and outwards; in femoral cases, it should be performed directly upwards; and umbilical ruptures are reposed by compressing them backwards.

The greatest benefit has been derived from the application of vitriolic æther to the swelling, so as to evaporate this volatile liquor by gradually dropping it on the part affected. If the patient be of a plethoric habit, copious bleeding becomes necessary; as it occasions relaxation, and prevents inflammation. In order to preserve the part in its natural situation, and to prevent a relapse, after it has been reduced, a sufficient degree of pressure must be applied to the ruptured spot; an object which will be most effectually attained by a *spring truss*. This instrument is manufactured in a superior manner by Mr. Bishop, of Walnut-street, Philadelphia.

The *reduction* of *umbilical* rup-

tures, if timely undertaken, is mostly effected by the application of a bandage. If, however, the treatment before stated, should not be attended with success, but the pain and other symptoms increase, recourse ought immediately to be had to a skilful surgeon ; as procrastination may render the malady incurable.

RUPTURE-WORT, the SMOOTH, or *Heniaria glabra*, L. an indigenous perennial plant, which grows in gravelly soils, and flowers in the months of July and August. ....This herb is, according to Dr. WITHERING, both saline and astringent; its expressed juice removes specks from the eyes ; and, when taken internally, it is likewise said to increase the secretions by the kidnies....BAUTSCH has employed it in tanning.....Cows and horses eat the plant ; and, though rejected by hogs and goats, it is much relished by sheep.

RUSH, or *Juncus*, L. a genus of plants, comprising 36 species, of which, according to Dr. WITHERING 17, but in the opinion of Dr. SMITH 19, are indigenous : of these, the following are the principal ; viz.

1. The *squarrosus*. See MOSS-RUSH.

2. The *conglomeratus*, ROUND-HEADED, or CLUSTER-FLOWERED RUSH, grows in moist meadows and heaths, where it flowers in the month of July or August. It is employed by the lower classes to form *rush-lights*, for which purpose it is peeled in autumn on three sides, and dipped in melted tallow. The soil producing this plant, generally contains a stratum of *peat*.

3. The *effusus*, COMMON or SOFT RUSH, or SEAVES, thrives in wet meadows and pastures ; flowers from June to August....It is eaten by horses and goats ; is also used for rush-lights, like the preceding species ; and sometimes manufactured into slight baskets. The common rush is cut about Midsummer, in the vicinity of Farnham, and dried in the same manner as hay ; after which it is formed into a kind of *mow*, and sheltered till the succeeding spring, when on account of its toughness it is usefully employed for bands, or ties, in fastening hops to the poles....In a fresh state, it is farther converted into brooms, or besoms, for blacksmiths, and other artisans working in metals.

All the species of Rush grow in wet situations, and have therefore been sown on the banks of canals, in order to consolidate the earth. But as they frequently abound on lands, that would otherwise be productive, different means have been adopted, with a view to extirpate them. This purpose has been attained by ploughing one furrow, and harrowing in a considerable quantity of dung ; after which a crop of oats is taken. Another method consists in pulling them out by the roots in July, and exposing them for two or three weeks, till tolerably dry. They are then gradually burnt, and their ashes spread on the land, thus affording an excellent manure...But, in order to prevent their future growth, the ground ought to be drained ; and, if any rushes appear, they must be annually eradicated, and the soil properly rolled.

RUSH, the FLOWERING, or WATER GLADIOLE, *Butomus umbellatus*, L. a native perennial plant, growing in slow streams and mud-

dy ditches; flowering in the month of June or July....This beautiful herb is a great ornament to the banks of our rivers and marshy ditches: it is refused by every species of cattle. From its strong leaves, the Dutch manufacture a kind of carpets and tapestry that are highly prized; and BOHMER observes, that they may also be converted into baskets, for packing fruit and other commodities.

RUSH, the HARE'S-TAIL, or SINGLE-HEADED COTTON-GRASS, *Eriophorum vaginatum*, L. a perennial plant, found in marshy heaths, on bogs and moors; principally in the northern counties of Britain....The whole plant, previously to its flowering in June, is eaten with great avidity by sheep; and it is asserted by shepherds, that these animals will, after being reduced by hunger, recover more speedily, and thrive much better on the hare's-tail rush, than on turnips. In a ripe state, however, it is chiefly used for rush-lights: the wool, or down growing on this plant, though short and brittle, may be applied to similar purposes with those of the COTTON-GRASS.

RUSH-GRASS, the PRICKLY, or LONG-ROOTED, *Shoenus Mariscus*, L. a native plant, which grows in marshes, ponds, and bogs, where it flowers in the months of July and August....This species is injurious to cows. It frequently abounds in pools to such a degree, as to form floating islands by its interwoven roots: the stalks attain from two to six feet in height, and are principally employed as a substitute for straw in thatching houses; for which purpose they are better adapted.

RUST, denotes the calces, or vulgarly the flowers of metals, which are generally produced by exposure to moist air, or in damp situations; though the former may also be obtained artificially, by corroding or dissolving metals, in a proper MENSTRUUM (which see); and in which case it is termed a magistery.

Having already pointed out. [See Article IRON.] A few general methods of preserving iron from rust, we shall, at present, only add a receipt by which the latter may be removed. It consists in combining a certain proportion of quick-lime with mutton fat, into balls, which must be rubbed on the utensil, till it has entirely obliterated the rust: after this coating has remained for a few days on the metal, it is removed with coarse flannel or other rags; when another composition, made of equal parts of charcoal, red calx of vitriol, and drying oil, is applied by continued friction, till the surface be restored to its pristine brightness.

RUST, or RUBIGO, in vegetable economy, is a disorder affecting certain plants. It consists of a feruginous powder scattered beneath the leaves, principally of the Ladies-mantle, Stone-bramble, and Ragwort, especially if these vegetables grow in a burnt woody soil.

Dr. DARWIN conjectures the *rust* to be a fungus, similar to the MILDEW, which resembles certain kinds of liverwort, and grows beneath the leaves of plants that are previously diseased. He conceives that it may be prevented, or destroyed, by exposing such vegetables to greater light and ventilation, in the manner already described.

RUTA-BAGA. See TURNIP.

RYE, or *Secale*, L. a genus of exotic plants, comprising five species, one of which only is raised in Britain, namely, the *Cereale*, or Common Rye. It was supposed by LINNÆUS to be a native of the Isle of Candia, whence it is said to have been introduced into Britain; but it is doubtless a northern plant, as it thrives and flourishes most luxuriantly in cold climates.

The common rye is divided into two varieties, viz. the Spring, White, or Silvery Rye; and the Winter, or Black Rye. Both are propagated from seed in the proportion of 2 or $2\frac{1}{2}$ Winchester bushels per acre, generally on poor, dry lime-stone, or sandy soils, where wheat does not thrive; and, if it be sown on such lands two or three successive years, it will at the end of that period ripen a month earlier than such as has, for a long series of years, been raised from strong cold ground.

The proper season for committing the seed to the earth, depends greatly on the nature of the rye: that for spring or white grain, is from February to March; as that for the black or winter rye, is from the middle of September to the latter end of October, in South Britain. Both these varieties, however, are advantageously sown together with wheat, at the rate of one peck of rye with one bushel of wheat: the seed of the former is also harrowed in among a thin crop of turnips, and both are *fed off* with sheep.

Formerly, considerable quantities of rye-meal were converted into bread; sometimes being kneaded alone, and occasionally with a small portion of wheaten flour. It is, however, seldom used at present in this country, on account of its being subject (especially during hot summers that succeed a wet spring) to a disease, known in France under the name of *ergot*; but which is called in England, *horned rye*, *spur*, or *horn-seed*. The grain thus affected grows out into large horns, containing a mixture of black and white farinaceous powder; and is said to appear as if it were pierced by insects, which are conjectured to cause the disease. By the use of such damaged grain, the poorer classes of people, both in France and England, have often been afflicted with fatal disorders, accompanied with extreme debility and gangrene, or mortification of the extremities. *Horned rye* is equally fatal to brutes; sheep, dogs, swine, deer; nay, geese, ducks, and other poultry, that were fed with it, by way of experiment, became violently convulsed, and died in great agonies. So deleterious, indeed, are its effects, that it has even destroyed the flies which settled upon it.

But though rye, when diseased, be thus prejudicial to men and animals, yet in a sound state it is an excellent grain for bread-flour, and often yields abundant crops. It may also be advantageously *fed off* early in the spring by sheep, and somewhat later with horses and cows; or, it may be mown and given to the latter in the stables....The straw of this grain is excellent for thatching, and is also used by brick-makers, collar-manufacturers, and for packing. Farther, we are informed by Mr. MARSHALL, that in the county of York the farmers always sow a small quantity of rye with their

wheat, which they believe is thus preserved from the injurious disease, known under the name of *Mildew*. Lastly, every kind of poultry have such an antipathy to this grain, that they avoid the place where it vegetates: hence it has been advantageously sown in *head-ridges*, around farm-houses, and yards, as a kind of protection to other grain.

With respect to its physical properties, we shall only remark, that pure and sound rye, though less nutritive than wheat in a similar condition, affords good bread; which, to persons of a sedentary life, is attended with the beneficial effect of preventing costiveness, or obstipation of the bowels.

RYE, the Wild. See BARLEY, the Wall.

RYE-GRASS. See DARNEL, the Red.

S.

SADDLE, a kind of stuffed seat, fastened to the back of a horse, for the convenience of the rider.

Saddles are divided into various kinds, according to the purposes for which they are designed; such as *hunting-saddles* for the chace; *side-saddles* for females, &c. Numerous accidents, however, happening, either from the spirited and turbulent disposition of horses, or the inability of riders to keep their seat in a proper and steady manner, ingenious artists have contrived means of preventing such misfortunes. Among these, we shall mention Mr. EDW. JONES' Woman's Saddle-tree, with a spring head; for the invention of which he obtained a patent, in May 1794. He constructs the *near side* head, or horn of the saddle-tree, so as to drop down by means of a steel, iron, or other spring; and, when the rider wishes to dismount, by pushing the head or horn from her, it will instantly fall, so that she may alight without danger, in case the horse should take fright, or run away: thus, her clothes will never be entanged in the horn, and all farther inconvenience arising from the common mode of constructing saddles, will be effectually avoided. Such spring may also be weakened, or strengthened, according to the ability of the rider, by means of certain screws; which, being turned or admitted into the upper part of the near

point, prevent the head from falling, contrary to her inclination or pleasure.

In May 1801, a patent was granted to Mr. WALTER INGLISS, for a method of making saddles, on a new and improved plan, by which the rider is enabled to perform longer journies on a *rough-trotting* horse, with greater ease than on any other saddle hitherto constructed; and also for contriving the stirrup-bars in such a manner, that if a rider happen to fall from, or be thrown off his horse, he will, in consequence, be immediately disengaged. This invention consists in giving elasticity to the seat of the saddle, by introducing a spring into the long *straining web*; and in attaching the stirrup-bar to the saddle, by means of a bolt connected with the rider, in such a manner, that, on falling off, or being thrown, he draws the bolt or fastening, and the stirrup is parted from the saddle. For a minute account of this patent, the reader will consult the 15th vol. of the *Repertory of Arts*, &c. where a full specification is given, and illustrated with an engraving.

SAFFLOWER, or BASTARD-SAFFRON, *Carthamus*, L, a genus of exotic plants, comprising ten species, the principal of which is the *tinctorius*, Common or Dyer's Safflower. It is a native of Egypt, and the warmer climates of Asia; is cultivated to a considerable extent in various parts of Europe, and particularly in the Levant; whence considerable quantities are annually imported into Britain.

The Safflower is propagated by the seed, early in the spring, sowing it separately in drills, at the distance of two feet and a half from each other. In the course of a month, the young plants will appear, and at the expiration of a similar period, it will be necessary to hoe the ground, leaving them six inches apart. A second hoeing will likewise be proper, when the plants should be thinned to the distance at which they are intended to remain. If the soil be stirred a third time, no farther attention will be required, till the flowers appear: the small blossoms, which form the compound flowers, ought to be cut in succession, as they attain to maturity: and then gradually dried in a kiln, of a moderate heat. In order to procure seed for a future crop, some of the plants should be left, till they are perfectly ripe; but BECKMAN advises not to choose any of the sickly plants for such purpose; as they will re-produce very small flowers. He farther observes, that the Safflower growing in Germany, might be fully equal to that imported from Turkey, if similar pains were taken in drying and preparing the flowers, previously in salt-water, as well as in choosing the proper soil. In the latter respect, agricultural writers are not agreed; for, in rich land, the plant seldom flowers till late in autumn; while, in a poor dry ground, it is in bloom at an earlier period; but the flowers are smaller, and yield a less portion of colouring matter. On the whole, a moderately dry and well-manured soil, appears to be best adapted to its culture, especially if it be sown early in February; as the young plants are not liable to be injured by the vernal frosts....The dry leaves of this vegetable are, in the winter, eagerly eaten by sheep and goats.

The flowers and seeds of the bastard saffron were formerly often used medically; but, at present, they are nearly exploded, and the former are principally employed for dyeing linen, woollen, silks, and especially cotton, which absorbs the tinging particles more easily, and retains the volatile hue of the safflower much longer, than any other stuff. This plant produces a variety of shades, from a bright-yellow to a deep-red, accordingly as it is treated with the addition of alum, pot-ash, cream of tartar, lemon-juice, or oil of vitriol, in due proportions.

[The following process for dyeing red, with safflower, was successfully tried by professor BECKMAN. He says "I boiled a piece of cotton several times in olive oil, then washed it thoroughly in cold water, and afterwards dried it. After this, I mixed water impregnated with the yellow colouring matter of the carthamus, or a yellow infusion of the carthamus, with pounded galls and alum. I then took cloth which had been premacerated in oil, and dipped it in this solution, after it had boiled a little, and found that the cloth, when wrung, was of a yellow colour. Having dried the cloth, I dipped it in the cold alkaline liquor of the carthamus, and then immersed it in lemon juice; and this being frequently repeated, the cloth appeared of a beautiful and full red. Cloth which had not been steeped in oil, but which in other respects had been exposed to the like process, was of the same colour, but a little paler; and for that reason, I recommend this mode of dyeing to those who do not choose to employ oil." See *Tilloch's P. Mag.* vol. xi.]

SAFFRON, or *Crocus*. L. a genus of plants consisting of seven species, two of which are indigenous: namely,

1. The *sativus v. officinalis*, COMMON, or AUTUMNAL SAFFRON, thrives in meadows and pastures; flowers in August and September. It is cultivated by planting out the roots in July, at the distance of five inches apart, and two inches deep, in a good, dry soil, that has previously been well ploughed, and manured with rotten dung.

In the beginning of September, the ground ought to be hoed, and the weeds carefully eradicated; as the growth of the saffron would otherwise be impeded. A short time after, the flowers will appear for several weeks; and they should be gathered, that is, the stigmata or fleshy summits of the pistils picked off, every morning in succession, before they are fully blown. Next, these tender filaments are to be gradually dried in a kiln, and preserved for use....A field of saffron will continue to be productive for three or four years, yielding progressively more numerous and larger flowers, as well as an increase of bulbous roots; which, after that period, may be advantageously transplanted to another situation.

Saffron is remarkably fragrant, and is highly esteemed; as it exhilerates the spirits, when taken in small doses; but, if used in too large portions, it produces immoderate mirth, and all the consequences resulting from the abuse of spirituous liquors. It imparts a beautiful colour to water, wine, or spirits, to which it communicates its virtues.

This drug was formerly consi-

dered an excellent remedy in hysteric depressions, originating from spasms, or from obstructions of the usual evacuations; but in modern practice, it is seldom employed, though it forms an ingredient in several medicinal preparations. The best saffron is that raised in England, which may be known by the breadth of its blades: it ought to be of a deep red or orange colour; fresh and tough, though neither too dry nor too moist; and of a strong, but pleasant aromatic odour. It deserves to be more generally known, that mercenary dealers often adulterate this valuable spice with *safflower*, or with the fibrils of dried *beef*: the former practice, which is more common and less troublesome, cannot be easily detected; but the latter species of fraud may be ascertained by infusing a few threads of suspected saffron in a wine glassful of simple water; and if, after standing 24 hours, the liquor acquire only a pale-yellow tint, instead of a bright-red hue, it may be concluded that it is not genuine.

2. The *vernus*, Spring or Garden Crocus, is found in meadows, chiefly in the county of Nottingham; it flowers in the month of March. This species is propagated by seeds in gardens, for the beauty of its flowers, which form a principal ornament in vernal nosegays.

Saffron, the Meadow. See Meadow-Saffron.

SAGE, or *Salvia*, L, a genus of plants comprising 60 species; of which the following are the principal, viz.

1. The *Pratensis*; and,
2. The *Verbenaca*. See Clary.
3. The *Officinalis*, or Common Large Sage, is a native of the southern parts of Europe, and cultivated in British gardens, for culinary purposes. There are several varieties of this species, namely, the common green sage, the wormwood sage, the green and red sage, both with variegated leaves; and a peculiar kind with red or blackish leaves; the last of which is most commonly cultivated, together with the wormwood-sage. Their flowers furnish bees with honey and wax; the whole plant is exceedingly grateful to sheep, and imparts a delicate flavour to the flesh of these animals.

4. The *tomentosa*, or Balsamine Sage, which is preferred to all the other species for *herb-tea*.

All the different kinds of sage may be propagated by seeds; but, as some of these useful plants do not attain to perfection in this country, the more eligible method of raising them, is generally by *slips*.

In a medicinal view, sage moderately warms and strengthens the alimentary canal: hence, in cold phlegmatic habits, it excites appetite, and may be of service to persons labouring under nervous debility. The best method of taking it, is by an infusion of the dry leaves used as common tea; or a tincture, or extract, made with rectified spirit, and given in proper doses. These preparations contain the whole virtues of the sage, while the distilled water and essential oil possesses only the warmth and aromatic quality, without any of its bitterness or astringency. Watery infusions of the leaves, with the addition of lemon juice, form an useful drink in febrile disorders, and are very grateful to the palate.

SAGO, is the medullary substance obtained from a species of the Palm-tree (*Cycas circinalis*, L.) a native of the Molucca and other islands of the East Indies. It is used as bread by the natives, who macerate it in water, and form it into cakes. The grains of Sago sold in the shops, are prepared in a manner similar to those of *Tapioca* (see CASSAVA): they furnish a nourishing and agreeable jelly with water, milk, or broth; but they should be previously cleaned; and, to dissolve them completely, the first decoction should be strained, and afterwards boiled a second time, for about half an hour. With a view to render it more agreeable, a small portion of lemon-juice, sugar, and wine, may be added. In this state, it forms an excellent dish as a restorative, particularly for the consumptive, convalescent, and those whose digestion is weak or impaired; but the coarser parts, which remain after straining the liquor, should not be eaten; as they are too flatulent for the stomach of invalids, and afford little nutriment. In phthisical cases, a decoction of sago in *milk*, will be the most proper; for wine and broth can be allowed only to patients who are free from febrile symptoms.

SAIL-CLOTH, a strong texture, made of hemp, for the purpose of supplying ships with sails. Although considerable quantities of this valuable article are annually manufactured in Britain, yet as they are not only inadequate to the demand for the navy, but being subject to the *mildew*, are consequently less durable than the sail-cloth imported from North America, we shall state the following expedient, adapted in that country, by which the cloth may be greatly improved. It simply consists in moistening the warp, in the loom, with a decoction or gelatinous substance prepared from the refuse of neat's-feet (after the oil is expressed), which is boiled in water, till it is converted into a kind of glue. The weavers of this article, in Britain, employ a paste made of flour and water, which necessarily renders the cloth brittle; whereas, by using the *animal* peparation above mentioned, the sail-cloth will not only be rendered more durable, but the expence may be lessened, and an article, that is at present thrown away, may thus be usefully employed.

SAINTFOIN, the COMMON, or COCK'S-HEAD, *Hedysarum Onobrychis*, L. a native perennial plant, which grows in meadows and pastures, on chalky soils, where it flowers in the months of June and July. There are several varieties, known under the names of White-flowered, Blue-flowered, Purple-flowered, Striped-flowered, and Long-leaved Hoary Saintfoin.

This plant thrives most luxuriantly on dry and chalky lands, in high and exposed situations, so that its culture would chiefly benefit the northern parts of Britain; for it requires no rich land, but a clayey and gravelly bottom. It is propagated from seed; the best of which has a bright husk; the kernel being plump, externally of a grey or blueish cast, but when cut, internally of a fresh greenish colour.

The proper season for sowing the Cock's-head, is in the month of March; the quantity of seed varies, from one to four, and even eight bushels per acre, broad-cast; though the most economical me-

thod is that of drilling it in rows two feet asunder; by which half a bushel is sufficient to stock an acre. This vegetable is, however, occasionally sown together with clover, or with barley, in the proportion of from one to three bushels per acre, to which 5lbs. of trefoil are generally added; as, the latter prevents the growth of weeds, till the saintfoin has taken deep root.

This species of clover is one of the most promising plants, which might be cultivated in Britain; and it is much to be regretted, that its introduction should be almost totally neglected by so many tenants or proprietors of poor, shallow, and stony soils; as it will produce, on their worst lands, at least one ton of hay, together with a considerable after-growth for grazing cattle. Saintfoin, indeed, will yield abundant crops for ten or fifteen years, at the expiration of which, it will afford an excellent pasture for sheep, during several succeeding years; and, if the soil be rich, it will produce two crops annually; except, however, in the first two or three years, when the growth seldom exceeds one load, or half a crop per acre: but no cattle should be suffered to graze on it, for the first winter; as their feet will injure it: nor should any sheep be fed on it during the second summer, because they are apt to bite the crowns or tops of the roots, the growth of which would thus be immediately checked.

At the expiration of seven or eight years, it will be proper to manure the soil with dung; and, if it be sandy, with marle. Should the first season for mowing prove wet, the saintfoin must be left for seed; it ought not, however, to be cut before it is in full bloom; as the quality of the hay would thus be materially injured; but, if it be given to cattle, while green, it will produce a second crop in the same year. Whether it be consumed in a fresh or dry state, it is equally useful for feeding cattle, and is said to fatten sheep more speedily than any other vegetable. It is farther believed to increase the quantity and improve the quality of milk in cows, the cream of which becomes not only richer, but the butter acquires a better colour, and more delicious flavour. Lastly, saintfoin is an uncommonly strengthening provender for horses, which, when fed with it, require no oats. [See vol. 3d. p. 200.]

SAL-AMMONIAC. See AMMONIAC.

SALEP, a nutritious preparation obtained from two species of the ORCHIS.

Different methods have been proposed and adopted, with a view to procure this nourishing substance; but the most simple is that of Mr. MOULT, already described [article ORCHIS.] We shall, therefore, only observe, that *Salep* might thus be prepared and sold at the low price of eight or ten pence per pound; and, as it is supposed to contain the largest portion of vegetable nutriment in the smallest compass, its powder has been recommended to form part of the provisions of every ship. Farther, salep possesses the valuable property of concealing the saline taste of sea-water, and retarding the acetous fermentation of milk. Hence Dr. PERCIVAL is of opinion, that it may be advantageously used in milk-porridge, especially in large towns, where that fluid is generally acescent, in con-

sequence of the cows being fed with sour grains, and similar acid food.

Beside the particular cases (stated under the article ORCHIS), in which this preparation is very useful, on account of its mucilaginous and restorative properties; salep is likewise of essential service in the *sea-scurvy*, as it obtunds the acrimony of the fluids, while it easily assimilates into a mild and salubrious chyle. Lastly, if administered in considerable portions, it is, according to Dr. PERCIVAL, an "admirable demulcent" in symptomatic fevers, which are occasioned by the absorption of pus or matter from ulcers in the lungs, from wounds, or after amputations; as it is eminently adapted to resist the dissolution of the *crasis*, or due mixture of the blood in the human body, and which generally takes place in such cases.

SALIVA, a term applied to the fluid, with which the mouth and tongue are continually moistened: it is secreted by the *salival glands*.

This humour is thin and transparent; it cannot be reduced to a concrete form by fire, and is almost totally divested both of taste and smell. It is supplied from the glands by mastication; and, being intimately blended with the aliment, essentially contributes to its digestion; serving also to improve the taste of food; to mix with, dissolve, decompose the nutritive matter into its principles; and to moderate thirst.

The saliva of hungry persons, and of such as indulge in violent passion is extremely acrid, penetrating, and profusely discharged. But, if this fluid be evacuated too copiously, for instance, by those who indulge in smoking tobacco, it excites thirst, and occasions loss of appetite, indigestion, and at length atrophy with all its attendant evils. On the other hand, if it be swallowed together with the oil deposited on the tongue from the fumes of that narcotic herb, its effects are alike pernicious. Nor is it advisable to absorb the saliva in sick-rooms, or places where malignant disorders prevail; because the contagious *miasma* might thus be introduced into the body, as well as by actual contact....See also CONTAGION, and INFECTION.

SALLOW, or WITHEN, *Salix caprea*, L. is an indigenous species of the willow, which, though it will vegetate in damp situations, requires a drier ground than any other of that genus. In a good soil, it attains the height of thirty feet...The tender shoots and suckers of this tree are, on account of their flexible nature, useful for baskets and wicker-work.....In Sweden, the young rind is not only employed with advantage by tanners, but also by dyers, for striking a deep black on linen-yarn, in combination with alder-bark. The former has likewise been profitably converted into PAPER, to which we refer.

SALLOW-THORN. See BUCK-THORN, the Sea.

SALMON, or *Salmo*, L. a genus of fish comprising 29 species, of which the following are the principal, viz.

1. The *fario*. See TROUT.
2. The *alpinus*. See CHARR.
3. The *eperlanus*. See SMELT.
4. The *salar*, or COMMON SALMON, inhabits the British seas and rivers, where it is caught in great numbers, the largest weighing from

30 to 40lb. though sometimes upwards of 70. These fish form, in several countries, a considerable branch of commerce, and are cured in various ways, by salting, pickling, and drying.

The salmon frequents both salt and fresh waters, quitting the former in the spring, for the purpose of depositing its spawn in the gravelly beds, remote from the mouths of rivers. Towards autumn, they again resort to the ocean.

Salmon is a very general and favourite article of food, and is used at the table, either *fresh*, *cured*, or *smoked*; in which last state, however, it is exceedingly unwholesome. The flesh of salmon, while fresh, is tender, flaky, and nutritive; but, being rather oily, it is difficult of digestion. In the spawning season, its flavour and tint are much impaired: when boiled or salted, it acquires a fine red colour. Those of a moderate size and middle age, are in the greatest perfection, both with respect to their taste and salubrity.... Salmon-trout are chiefly distinguished from the common fish of that name, by their soft and gelatinous nature

SALT is one of the component parts of animal, vegetable, and mineral bodies. It may be distinguished from other matters, such as earths, by its solubility in less than 200 times its weight of boiling water; by affecting the organs of taste; and being capable of crystallization, either by itself, or in combination with several earths or alkalies.

Salts are divided into two principal classes, namely, *acid* and *alkaline*; from the mutual combination of both, there is formed a third kind, known under the name of *neutral* salts.

I. *Acid salts*, possess a sour taste, and change the blue colour of vegetable pigments into red. They are divided, according to the three kingdoms of Nature, into vegetable, animal, and mineral; but, having already given an outline of the distinction (vol. i. p. 11, 12), we must refer the reader to the principal acid salts, under their alphabetical heads.

II. *Alkaline Salts*. See ALKALIES, BARILLA, PEARL-ASH, POTASH, and SODA.

III. *Neutral Salts*, are such as are obtained from a combination of acids and alkalies.

The principal and most useful of this class is, the *Common* or *Sea-salt*. It differs from all other neutral substances of this nature, in its taste being purely saline, and occasioning thirst after it has been swallowed. The primitive figure of its crystals is that of a cube; but, on evaporating a solution of salt, the smaller cubic particles assume the secondary form of hollow squares. When the crystals are perfectly pure, they are not affected by moist air; and in this state, 100 parts contain, according to BERGMAN, 52 of muriatic acid, or spirit of salt; 42 of soda, or mineral alkali; and 6 of water of crystallization: though we believe, with GREN, that the proportion of the fluid part is greater, and that of the two first ingredients somewhat smaller. Nature furnishes us with this neutral salt, either in a solid state, in mines; or dissolved in the sea: or in saline springs.

If it be obtained from the bowels of the earth, it is called *Rock-salt*; and is generally very hard,

and transparent, though it is sometimes opaque, white, and sometimes of red, green, blue, or other shades. The purest of this kind is colourless; the other species are purified by solution in water, and by re-crystallization, before they can be employed for culinary purposes. The principal mines of Rock-salt are in the vicinity of Cracow, in Poland, and at Northwich, in the county of Chester.

The salt, however, which is thus easily procured, and in very large masses, by no means affords a sufficient supply: hence numerous persons are employed in extracting it from *sea-water*, or from *saline springs*. The former yields only from one-50th to one-30th part of its weight, but the latter produce the greatest quantities; and we are informed by Dr. Browning (*Art of Making Common Salt*, &c. 8vo.), that the celebrated saline springs of Northwich, Nantwich, and Droitwich, in Cheshire (whence Great-Britain is principally supplied), contain more than one-sixth part of good salt.

Common salt is obtained from these natural solutions by two different methods: First, the saline fluid is speedily evaporated, till the salt begin to concrete, and settle in the form of grains at the bottom of the pans; after which it is put into proper vessels for draining the brine; and, when the process is completed, it is called *bay-salt*. By the second method, the evaporation is slow and gradual; so that it is continued only till a saline crust is formed on the surface of the liquor, which soon shoots into crystalline cubes.

[The manufacture of salt in the United States, is of more importance than is generally imagined. The editors of the Medical Repository of New-York, (Hexade 2d. vol. i. p. 83,) have shewn by a statement, that, though the salt-springs in New-York, in Ohio, in Indiana, Kentucky, Tennessee, and in other places, furnish the interior country with large quantities of salt, still it is a fact, that by far the greater proportion of the salt consumed in the United States is brought from abroad. It appears, that from the first of October, 1800, to the 30th of September, 1801, 3,282,063 bushels of salt were imported, and of this quantity, 1,269,398 bushels were imported from England. This salt, which chiefly comes from Liverpool, and the Mersey, is both weak and impure; as sea-water, brine-springs, and rock-salt, generally abound with various other earthy and saline ingredients, such as lime, magnesia, epsom-salt, gypsum, glauber's salt, &c. all of which injure the quality of salt, and disqualify it for preserving animal flesh.]

In the first volume of the *Transactions of the Royal Society of Edinburgh*, we meet with a memoir, by the Earl of Dundonald, containing an account of a new expedient of purifying sea-salt. He observes that the common salt is mixed with various substances, which in a great measure render it unfit for the important purpose of preserving food; and which appear from his experiments to be nauseous, bitter, and cathartic salts, with earthy bases. And as the mode of purifying salt by dissolution in water, and precipitation of the earthy matters with fossil alkali, is not only too tedious, but also too expensive for common use,

Lord D. proceeds on the fact, that *hot* water, when saturated with sea-salt will still dissolve some portion of bitter salts. [He therefore directs the following process to purify this useful article....." Take a vessel of a conical figure, with a hole in the small end of it, put it near the fire with the bottom uppermost; fix it in such a manner, that it may be moderately heated by a stove or flue going round it; fill it with salt; take a twentieth part of the salt contained in the vessel, dissolve it in its proper proportion of water, in an iron pan, let it boil, and pour it, when hot, upon the surface of the salt in the conical vessel. The hot and fully saturated solution will dissolve no more sea-salt, but will, as it descends, and filtrates through the salt in the vessel, dissolve the magnesia salita, and magnesia vitriolata, which will drop out at the aperture in the small end of the vessel. After the liquor has ceased to drop, take out one twentieth part more of the salt contained in the vessel, and proceed as aforesaid. Repeat the same process with salt out of the vessel until what remains be as pure as required. Three washings in this manner will render home-made salt purer than bay. Each operation renders the salt 4½ times purer than it was before.

" Its purity, leaving out the small fractional parts in each multiplication, will increase in the following progression:

First operation,	. .	4-5
2.	do. . .	20
3.	do. . .	91
4.	do. . .	410
5.	do. . .	1845

" The superior quality of salt thus freed from the bitter nauseous salts, is no less obvious to the taste, than its effects are in salting or preserving fish, meat, and butter, which I have satisfied myself of, by a variety of experiments."

At Dennis in the county of Barnstable, Massachusetts, common salt is crystalized from the water of the ocean, without culinary heat or boiling, in considerable quantities. The amount is stated at twenty thousand bushels a year of domestic sea-salt. This is estimated at one fifth of the quantity consumed in the Cape Cod fishery, annually, which is reckoned to be one hundred thousand bushels. It is stated to be excellent in purity, whiteness and weight. It resembles the first quality of Isle of May salt, and is as heavy as eighty pounds the bushel. Great improvements have been made in cheapening the erection of the works and in abridging the performance of labour. At the same place GLAUBER'S salt is prepared in great quantities, to the amount it is believed of fifty tons per annum. It may be made there equal to any in the world, and abundant enough for the whole home market and the West India islands.

It is expected that both epsom salt and magnesia will be prepared from the bittern, as soon as the manufacture is a little further advanced, and the artists shall have had further time to gain practical skill by experience.]

Various other, though more complicated attempts, have lately been made by private individuals, to expedite and improve the pre-

paration of salt, as well as to decompose it with a view to extract the *soda:* among these we shall mention only the following patents: namely, Mr. GEORGE HODSON'S, obtained in August, 1792, for his new method of separating fossil alkali from common salt; and also of separating the same substance from kelp; his second patent, granted in February, 1797, for an improved mode of effecting the same object; and likewise of extracting the mineral alkali from the muriatic acid, contained in rock-salt, common salt, brine, &c. Mr. JAMES MANLEY'S patent, dated July, 1801, for various improvements in the process of manufacturing salt. As, however, these different processes would not be generally interesting, and could be understood only by the aid of engravings, the inquisitive reader will consult the 2d, 10th, and 15th volumes of the *Repertory of Arts*, &c.

Uses: The value of salt for culinary purposes is well known: it is likewise of peculiar service in preserving the health of cattle (see vol. ii.), and particularly in preventing that most fatal disorder in sheep, the *rot* (see that article). Besides, salt is an excellent MANURE; as it is equally destructive to weeds and vermin: the most accurate proportion appears to be *sixteen bushels per acre;* but, if that quantity be exceeded, or doubled, it will produce effects diametrically opposite to those intended, and completely check vegetation.

With respect to its medicinal properties, common salt, when taken in small quantities, promotes the appetite and digestion; but, if given in large doses, for instance, half an ounce, it operates as a laxative. It deserves, however to be remarked, that its useful properties are greatly changed in a state of intimate combination with animal matters: thus, salt-butter and salt-meat, or fish, are less wholesome than those substances when eaten in a fresh state, with a due proportion of that domestic spice; nay, if used too frequently, the former often lay the foundation of tedious maladies, such as leprosy, scurvy, and other cutaneous eruptions..... Lastly, salt is sometimes administered with a view to restrain the operation of emetics, or to carry them off by stool; and likewise as a stimulus in clysters.

A new species of *neutral salt* has lately been discovered in France, an account of which we have abstracted from M. CHAUSSIER'S *Memoir*, inserted in the 87th No. of the "*Recueil Periodique*," a Medical Journal published at Paris. This new salt is the *sulphurated hydro-sulphur of soda*, and is formed spontaneously in manufactories where the sulphate of soda, or GLAUBER'S SALT (which see) is decomposed, by being melted in a reverberatory furnace, with a certain portion of iron filings, and carbon of charcoal. Our limits will not permit us to state the whole of this process; we shall therefore only observe, that the sulphurated hydro-sulphur of soda is found in the leys which remain, after the carbonate of soda has been obtained by ebullition. Such leys being suffered to stand for some time, a crystallization takes place in the residuum; and the crystals appear of a dusky yellow colour, being sometimes soiled, or tinged with a black powder, adhering to their surface: these are next thrown into a proper quantity of water; and,

when almost dissolved, the fluid is strained and deposited in a cool place, when the saline matter will again be crystalized. Thus purified, the salt forms large transparent crystals, having a fresh taste, which speedily becomes somewhat bitter: it retains its form and properties on exposure to the air, neither deliquescing, nor crumbling into powder.

M. CHAUSSIER has successfully administered this neutral salt in cases of inveterate herpetic affections, which were not accompanied with fever or inflammation :.... he observes, that it may also be prescribed in certain intestinal diseases, occasioned by metastases, or the repulsion of a psoric and scorbutic virus.....The doses must at first be small, and gradually increased; while the efficacy of the drug may be promoted by diluents, or such drinks as are best calculated to alleviate the situation of the patient.

SALTING MEAT. See BEEF; BRINE; FLESH-MEAT; PICKLE, PORK, &c.

SALTPETRE, or NITRE, a concrete saline matter, the nature and properties of which have already been stated, vol. iii. p. 195..... Without entering into the particulars relative to the most economical method of manufacturing this useful salt, we shall briefly point out the requisites to its generation: 1. Animal and vegetable matters intimately blended and exposed to a moderate temperature; 2. Such a degree of moisture, especially with urine in which nettles, thistles, artichokes, and similar plants have been boiled, as will promote corruption, without inducing actual putrefaction: 3. The earth employed ought to be of a loose and porous texture; for instance, the clay of old mud-walls, or a due admixture of chalk, quick-lime, &c. 4. A sufficient length of time, namely, from six to twelve months, and upwards; as, otherwise, a very small quantity of *nitre* will be obtained by crystallizing the ley made of the *salt petre-rot*, or the earth after it has been exposed to the influence of the atmosphere in triangular beds, under proper sheds..... The manner of extracting such earth is exceedingly simple and easy, by means of tubs with numerous holes at the bottom, lined with straw, over which the mould is placed in alternate strata, with a little pot-ash either strewed between them, or dissolved in the boiling water, which is gradually poured over the solid materials: there is nothing farther required, than proper wooden pails with transverse sticks, in which the liquor, after evaporating it to a proper consistence, is poured and suffered to stand for several days, slightly covered, till the crystals are formed. The remaining fluid, or *mother-ley*, is again to be boiled, and poured over a new portion of the earth taken from an old nitre-bed, so that none of it may be wasted. Such is the process that is generally followed in the most profitable saltpetre-works of Germany.

Though nitre affords one of the most extensively useful articles in the arts and manufactures (see AQUA-FORTIS), as well as in medicine, yet this powerful salt, when inadvertently taken in too large quantities, is one of the most fatal poisons. There are several attested cases on record, in which from half to a whole ounce of saltpetre

has occasioned violent vomiting, convulsions, swelling, and other painful symptoms in persons who, by mistake, had swallowed it in a dissolved state, instead of Glauber's, or similar salts. The most proper antidotes, in such distressing situations, will be a scruple or half a dram of ipecacuanha with a tea-cupful of sweet-oil, and a large quantity of warm water to be drunk after it, to promote its operation as an emetic. Where this remedy cannot be procured on the spur of the occasion, it will be necessary to make use of copious and frequent draughts of mucilaginous decoctions of marsh-mallows, pearl-barley, salep, or arrow-root powder, sago, tapioca, &c. after which a gentle opiate will afford the desired relief. In all instances of this nature, however, it will be advisable immediately to resort to medical advice.

SALTWORT, or GLASSWORT, *Salsola*, L. a genus of plants comprising nine species, of which two are indigenous: namely,

1. The *kali*, PRICKLY SALTWORT, or KELPWORT, grows frequently on sandy sea-shores, and flowers in the months of July and August.

2. The *fruticosa*, SHRUBBY SALTWORT, or SHRUB STONE-CROP, thrives likewise on sandy sea-shores, and flowers in the month of August.

Both these species are used for making the salt known under the name of *kali*, considerable quantities of which are employed in the manufacture of glass. The process is as follows: A trench being dug near the sea, laths are placed across it, on which the herb is laid in heaps; a fire is then kindled below, and the liquor extracted from the plants, drops to the bottom, where it ultimately acquires a thick consistence, when it becomes kali; which is partly of a black, and partly ash-colour; very sharp and corrosive: being of a strong saline taste. When thoroughly hardened, it resembles solid stone, and in this state is fit for use. See KELP.

SALTWORT, the JOINTED, or *Salicornia*, L. a genus of plants, comprising nine species; one of which only, according to Dr. WITHERING, but, in the opinion of Dr. SMITH, two, are natives of Britain, viz.

1. The *herbacea*, JOINTED GLASSWORT, SEA-GRASS, or MARH SAMPHIRE, is very common on sea-shores, and flowers in the months of August and September.

2. The *fruticosa*, or SHRUBBY SAMPHIRE, grows likewise on sea-shores and the sides of roads, where it flowers from August to September.

The ashes of both these species yield fossil alkali, which is in great request for manufacturing soap and glass. It is chiefly prepared on the Mediterranean coast, and is called *soda*; the best of which is imported from Spain, under the name of *barilla*. When young and green, this vegetable, steeped in vinegar, with the due portion of salt, affords a pickle very little inferior to samphire. The whole plant has a saline taste, and is devoured with avidity by all kinds of cattle, being a very wholesome food, especially for sheep.

SALTWORT, the BLACK, or SEA-MILKWORT, *Glaux maritima*, L. a native perennial plant, which grows in salt-marshes, and flowers in the months of June and July.... This saline plant is often used as a pickle, and may likewise be eaten

as salad, or cooked among other vegetables. It is also much relished by cows; and BECHSTEIN observes, that it uncommonly increases their milk; on which account it merits to be cultivated in congenial soils.

SAMPHIRE, the ROCK, or SEA SAMPHIRE, *Crithmum maritimum*, L. a perennial plant, growing on the British Sea-coasts, among gravel and rocks, where it flowers in the month of August. This vegetable is much relished as a pickle, and likewise employed as a pot-herb. Dr. WITHERING informs us, that sheep and cows eat it with avidity, and have, in consequence, been observed to grow exceedingly fat.

SAND, a genus of fossils, consisting of small grains of siliceous stones, which are insoluble both in water and acids; being transparent, and vitrifiable by intense heat. They are mixed with various matters, whence they acquire different colours; and are divided into white, red, yellow, brown, blackish, and green sands.

This fossil is of extensive utility in the manufacture of glass; a fine white sand, found in the vicinity of Lynn, Norfolk, being employed for making white glass; and a coarse greenish sand for the common green or bottle glass. It is likewise an excellent manure for clayey land, in the proportion of from 40 to 50 loads per acre, and also for moorish soils, at the rate of 160 loads, The best for such purpose, is that known under the name of *sea-sand*, the good effects of which will be more evident, in proportion to its distance from high-water mark; next in quality, is that washed down by the rain on gravelly soils; but the worst sands are those which are dry and light, because they are liable to be drifted or blown about by every gust of wind.

[Sea sand is much used at Long-Branch, and Shrewsbury, in Monmouth county, New-Jersey, as a manure.]

Lastly, it was suggested a few years since by Dr. STRUVE, that rape, linseed, or other oils, might be divested of their colour, and also of any ill smell or rancidity, by simply agitating them in water mixed with sand; a large proportion of the former being employed and changed for a purer fluid, as often as it becomes turbid. Dr. S. observes, that he employed this method with success on a small quantity of oil in a phial. We understand, however, that similar experiments have been made in Britain, but which did not succeed. Hence we are inclined to attribute such failure to a different, or impure, kind of sand used for that purpose; and therefore advise those who wish to avail themselves of this hint, previously to wash and dry the sand; next to submit it to the fire in a crucible; and, while red-hot, to pour it into pure water: by repeating this simple process two or three times, a very soft, friable sand will be obtained, and which may be farther improved by triturating it in a glass mortar, together with water; afterwards washing, then suffering it to subside in a closed vessel; decanting the fluid, and again drying it. Thus prepared, we venture to promise a successful result.

SAND-EEL, or *Ammodytes tobianus*, L. a fish, resembling an eel, but seldom exceeding one foot in length. It abounds on the sandy shores of Britain during the sum-

mer months, where it conceals itself, after the tide has retired, at the depth of twelve inches in the sand. In some places, this fish is frequently dug out, and in others it is drawn up by means of a particular hook contrived for that purpose.

The sand-eel is usually employed by way of bait, for taking other fish; though it is sometimes carried to the table, being reputed to be very *delicate eating*.

SAND-PIPER, or *Tringa*, L. a genus of birds, comprising 45 species, 18 of which are natives of Britain: the principal of which are,

1. The *pugnax*. See RUFF.

2. The *alpina*, or DUNLING SAND-PIPER, whose back, head, and upper part of the neck are of an iron colour, marked with large black spots; the lower part is white, with short dusky streaks; in size, it is somewhat larger than the lark. These birds are found on the British shores, but principally on the coast of Yorkshire; where they are taken in great numbers, and much esteemed at the tables of the luxurious.

SAND-STONE, a genus of fossils found in various parts of Britain, and which is divided into four species, namely:

1. *Calcareous Sand-stones*, which consist of carbonate of lime and marle, with a considerable portion of sand intermixed with its particles. Their surface is rough, generally grey, though they are sometimes found of a yellowish or brown cast....This species is occasionally burned for lime.

2. *Aluminous Sand-stones* are those, the basis of which is *alumina*, or pure clay. They are of a close and compact texture, which is finer or coarser according to the size of the sand forming their constituent parts. This species is usually grey, yellow, or brown, and is chiefly manufactured into mill-stones, filtering-stones, or coarse whet-stones.

3. *Siliceous Sand-stones* are composed of grains of sand, that are cemented together with *silica* or flint, or with some substance, the basis of which is formed by the last mentioned fossil. They are considerably harder than any of the other species.

4. *Ferruginous Sand-stones* consist of large, loose particles of sand, which are cemented together by means of the rust of iron; being soft, and usually found of a dark red, yellow, or brown colour.

Sand-stones are of great-utility for buildings designed to resist the combined effects of air, fire, and water. Some of these fossils are soft while in the quarry, but become hard on exposure to the air. Those of a friable nature are generally employed, being best adapted to this purpose; because the hard kinds are apt to burst in the fire: the latter, however, will admit of being polished, and may be advantageously used for whet-stones.

SANDWORT, or *Arenaria*, L. a genus of plants, comprising 43 species, 7 of which, according to Dr. WITHERING, but with Dr. SMITH 10, are indigenous: the principal of these is the *marina*, or Sea-spurrey Sandwort, which is perennial, grows in salt-marshes and on the sea-coast, where it flowers from May till October..... This succulent vegetable bears great resemblance to samphire, and considerable quantities of it are actually pickled, and sold for that plant.

SANDAL, or SANDERS the RED, *Pterocarpus santalinus*, L. a tree which is a native of the East Indies, whence its wood is imported into Britain, in the form of large billets. The best kind is externally of a dull-red, or nearly blackish colour, internally brown-red; being of a compact texture, and possessing neither a peculiar smell, nor taste.

Red sanders is chiefly employed as a colouring drug, in the compound tincture of lavender; for there is scarcely any other oil to which it communicates its tinge. When reduced to a fine powder, it is more effectual for dyeing, than if it be merely cut into small pieces; but the powder of red sanders commonly sold in the shops, is often moistened with acids, and adulterated with other substances.....BOHMER observes, that wool dyed of this wood becomes hard; and that the colour may be rendered much darker, by the addition of common salt and sal-ammoniac dissolved in the ley:....the Dutch are supposed to macerate this tinging substance in urine, for a similar purpose.

Sandal-wood communicates a deep red to rectified spirit, but imparts no tinge to water....GEOFFROY and others have remarked, that the Brazil woods are sometimes substituted for red sanders; a fraud which may be easily ascertained, by immersing a small portion of the former in water, with which its colour readily combines.

SANDARACH, a gummy-resinous substance, exuding from an exotic species of the juniper-tree. It is imported in the form of small pieces or tears resembling pease, which are transparent; of a pale-yellowish colour; very brittle and inflammable; possessing a pungent aromatic taste, and emitting a fragrant odour when burnt.

Considerable quantities of this gum are consumed by varnish-makers, who dissolve it in the oils of turpentine, or linseed, or in spirit of wine, and thus prepare a kind of varnish, known under the name of *vernix*, which is used by cabinet-makers and painters. Gum-sandarach is also pulverized and passed through a fine sieve; in which state it is called *pounce*; and, when rubbed on paper, from which writing has been erased, it prevents the ink from spreading, when new characters are substituted.....This drug is subject, on importation, to the duty of 7*s*. 8½*d*. per cwt.

SANDERS, the YELLOW, or WHITE, *Santalum album*, L. a native of the East-Indies, whence its wood is imported. It is of a pale-yellowish colour, a pleasant smell, has a bitterish aromatic taste, accompanied with an agreeable pungency.

From this elegant wood, the Chinese of distinction obtain their coffins, which are said to resist the effects of the air and moisture, for a long series of years. They also reduce it to powder, and, with the addition of water, convert it into a paste, which is applied to their bodies, furniture, &c. probably with a view to serve as a substitute for the more expensive odoriferous oils: the powder is also employed for incense in their idolatrous temples.....In Europe, however, it is chiefly prized by cabinet-makers for the purpose of veneering.

This fragrant vegetable is, at present, very seldom used in medicine. When digested in pure

spirit, it produces a rich yellow tincture; from which, on distillation, the spirit arises without any remarkable flavour. Such preparation is, by HOFFMAN, considered as a medicine possessing similar virtues with ambergris; and he recommends it as an excellent restorative in great or general debility.....By distilling it with water, yellow sanders-wood produces a fragrant essential oil; which, on becoming cold, congeals and acquires the consistence of a balsam. [See article DYEING.]

SANDIVER, or SALT-OF-GLASS, is a species of whitish salt, that is separated from the surface of glass, while in a state of fusion. It is of a pungent, corrosive taste, and is employed by farriers for the purpose of cleansing horses' eyes.

This substance is said to be detergent, and is, therefore, occasionally applied to the human skin, for removing foul spots: it is also sometimes used as desiccative in ulcers, shingles, and similar complaints; nay, it is even strongly recommended as a tooth-powder; though we believe it to be a very improper and hazardous dentrifice.

[SANGUINARIA CANADENSIS, called commonly *Puccoon*, blood-wort, red-root, Indian-paint, turmeric.

The root is from one-fourth to half an inch in diameter, from three to four inches long, sending forth numerous stringy fibres, 2 or three inches long: a coloured liquor is thrown out when the root is broken.

The stalk is six or eight inches long, and of the thickness of a quill. The leaves are cordate and lobate. There is but one leaf to a stalk; on each lobe, one large fibre of a light yellow colour, may be seen running from the stalk, and many smaller ones branching from it in all directions. Flowers in April.

This plant abounds in our woods. The powdered root, in doses of 15 or 20 grains, is powerfully emetic..... Eight grains is a mild dose, and is but little inferior to ipecacuanha. It contains a large proportion of gum, some resin, and extractive matter. The first and last are the most active parts. The juice of the root dyes a fine orange colour, and is much used by the Indians. The *murio sulphate* of tin, as a mordant produces a handsome colour, sufficiently permanent on cotton and linen. The sulphate of alumine, or alumine alone, are also tolerable good mordants for silk and flannel.

The leaves and seeds of the plant are powerful and diffusible stimuli; promote sweat, and are given in Maryland with that view to horses to promote the shedding of their coats. A tincture of the root is used to prevent the intermittent fever; and a decoction of the roots to cure the dysentery. In one case, it operated powerfully upon the uterus and produced abortion, hence it might be useful in female obstructions. The above account is taken from Dr. DOWNEY's Inaug. Dissert. on *Sanguinaria*, Philadelphia, 1803.]

SANICLE, the Yorkshire. See BUTTER-WORT.

SAP, in botany, denotes the juice of plants, which is prepared by the moisture absorbed by their roots and leaves, whence it is circulated throughout every part, so as to constitute their nourishment.

The *sap* of vegetables has been compared to the *chyle* of animals: according to Dr. DARWIN, the former consists of sugar, water, and

mucilage, together with other transparent solutions; for instance, those of phosphorus, carbon, and calcareous earth. The sap, when first absorbed by the roots, is thin and watery; but, during its progress, it acquires more consistence; and, when it arrives at the leaves, it is assimilated to the nature of the plant.

The circulation of this juice has generally been supposed to be performed in an uniform manner: it appears, however, from the experiments of Mr. FAIRCHILD, a late eminent gardener, that it has an irregular motion, directly contrary to its primary course; a discovery which is of considerable importance in horticulture. This agreeable and salubrious art may thus not only be improved, but also great advantage may be derived from the general application of this principle; as barren trees may now be rendered fruitful, and old or decaying ones restored to their original vigour....See JUICE.

SAPFLOW. See FLUX.

SARSAPARILLA, or *Smilax Sarsaparilla*, L. is a native of the West-Indies, whence its medicinal root is obtained.

This drug has a glutinous, somewhat bitter, and agreeable taste, but is totally devoid of smell. It is highly esteemed on account of its demulcent and farinaceous qualities, and has been successfully administered, in the different forms of decoction, extract, and powder, in cases of carious and ill-disposed cancers, or other sores. It is taken in doses of half an ounce of the root boiled in half a pint of water, till the third part be evaporated: or half a dram of the extract; in either of these forms, it acts by the skin as well as by the urinary passages, and is a mild, though inert remedy; on which account it is generally combined with the sassafras, guaiacum, liquorice, and other substances, in a *decoction of the woods*.

SASSAFRAS, is the wood, bark and root of the Sassafras tree, or *Laurus Sassafras*, L. a native of America, the properties of which we have already described, vol. i. p. 211. It is imported in long straight pieces, which are of a very light and porous texture; emitting a fragrant odour; and having an aromatic sub-acrid, though sweetish taste. The strongest parts are the bark and small twigs.

Sassafras is a warm, aperient, and strengthening medicine; it has often been successfully given in the forms of infusion and decoction, for improving the tone of the stomach and bowels, in persons whose humours were in a vitiated state..... HOFFMAN has frequently prescribed a scruple of the extract of sassafras, with great benefit, in hypochondriacal spasms, and also at the decline of intermittent fevers..... Infusions of this drug are sold in the streets of the metropolis, under the name of SALOOP.

SATYRION, or LIZARD-FLOWER, *Satyrium hircinum*, L. a native perennial plant, growing in chalky meadows and pastures; flowering in the months of June and July.....Its leaves are very large, and the whole plant has a rank, disagreeable odour: nevertheless, it is eagerly eaten by cattle, and is said, in a remarkable degree, to increase the milk of cows.

[SAUR-KRAUT. This preparation was mentioned before under the head CROUT. The following directions for making it, are given

by Dr. Willich. In Pennsylvania it is a very fashionable dish among the Germans, and when prepared with neatness, is highly palatable, especially when eaten with salt pork.]

The soundest and most solid cabbages are selected, cut very small, put into a barrel in layers, about a hand high, over each of which is strewed a handful of salt and caraway seeds: in this manner, the layers are closely rammed down, one upon another, till the barrel is full, when a loose cover is put over it and pressed down with a heavy weight. After standing for some time, the mass begins to ferment; and as soon as it subsides, the head is fitted into the barrel, which is then finally closed, and its contents preserved for use. After being once opened, the *kraut* must be carefully compressed with a loose cover, and fresh salt and water every time substituted for that which is become foul, floats on the top, and should be removed. As this preparation has been found of considerable efficacy as an antiscorbutic, in long sea voyages, particularly those round the world, performed by the late Capt. Cook, it deserves to be more generally known in this country: and though its flavour is far from being agreeable to those who taste it for the first time, yet we are convinced from experience, that it will soon be relished, even by delicate ladies, whose reason is superior to prejudice or custom. We could not recommend, a more antiseptic and wholesome dish, especially if it be managed with care and strict attention to cleanliness.

SAUSAGE, a well-known preparation of food, consisting of beef, pork, or veal, cut in small pieces; seasoned with pepper, sage, or other spice; and then closely stuffed into skins obtained from the intestines of animals.

The most esteemed sausages are those made at Bologna, Venice, and other parts of Italy, whence considerable quantities are annually exported to various countries in Europe. They are made of raw pork beaten to a pulp in a mortar, together with garlic, pepper, and other spices; which, being intimately blended, are filled in the same manner as the common sausages, excepting that the larger intestines are preferably employed by the Italians.

This species of food affords very substantial nutriment, in whatever form it may be dressed:....sausages should not however, be eaten by persons of weak or relaxed habits; as a vigorous stomach is required to digest them. The most unwholesome preparations of this kind are *blood-sausages*, more generally known under the names of *hog* and *black puddings*. These are composed of bacon and the blood of the same animal, together with thyme, sage, and other vegetable spices, to correct in some measure their rancidity. Such incongruous mixtures, however, is at all times difficult of digestion; and, if the sausages have been *smoked*, the bacon necessarily becomes still more acrid, while the blood is concreted: in this state, the whole forms a most pernicious compound, which ought never to be eaten, even by persons who possess the most active powers of assimilation.

SAVIN, or *Juniperus Sabina*, L. an exotic evergreen shrub, which has small, rather prickly leaves, and produces blue berries,

only after it has arrived at a considerable age. Its stem attains the height of seven feet, and is apt to grow in a reclining posture: the wood is internally of a beautiful reddish shade, resembling that of mahogany.

The savin is of slow growth, but may be easily propagated by layers, by cuttings, or by the berries: if the latter can be procured, they should be sown in beds of common light earth, and in the spring or autumn, the young plants are to be set out in nursery-rows, two feet asunder. In October, November, or early in April following, they must be carefully transplanted to the place of their destination.

The leaves of savin possess a bitter, acrid taste; and their smell is so powerful and disagreeable; that it expels *moths* and similar vermin. When distilled with water, these leaves yield an uncommonly large proportion of essential oil.

With respect to its medicinal properties, savin is warm, stimulant, and aperient, being well calculated for promoting sweat, urine, and all the glandular secretions.... Hence a conserve made of its tops and leaves has afforded permanent relief in obstinate gouty and rheumatic cases, if taken for several months, nay, for a whole year, in small doses of a tea-spoonful or two, every morning and evening: few parients, however, will submit to swallow this nauseous drug; though it requires only a certain degree of resolution at the commencement...The oil distilled from this shrub is one of the most violent emmenagogues, and ought therefore to be used with the greatest caution in obstructions of the uterus, or other viscera proceeding from laxity or weakness. No druggist should sell this preparation to strangers.

An essential oil and watery extract of the savin are also kept in the shops.

SAVORY, or *Satureia*, L. a genus of exotic plants, consisting of nine species, of which the following are the principal, namely:

1. The *hortensis*, or Summer Savory, an annual herb, propagated from seed, which ought to be sown early in August on beds of light earth:....if the plants are intended to remain in the same situation, the seed should be sparingly scattered; but, if they are designed to be transplanted, it may be sown more closely.

2. The *montana*, or Winter Savory, is a perennial vegetable, likewise obtained from seed, which requires only a poor dry soil, where the plants will continue for many years, uninjured by the severest winters. As, however, the shoots will not be well furnished with leaves, when several years old, it will be proper to raise an annual stock of young plants.

Both the summer and winter savory have long been cultivated in the British gardens, for culinary, and medicinal purposes. Their warm aromatic, and pungent leaves, are much esteemed in salads: formerly, they were employed medicinally, with a view to attenuate viscid humours, to dispel flatulency, and to increase the appetite....According to Prof. BRADLEY, this herb, when dry and put into a bed, possesses the remarkable property of expelling fleas.

SAW-DUST, is the coarse powder remaining after any wood or timber has been separated or

cut asunder with a saw. It is frequently employed as a substitute for sand, and strewed on the floors of public and other buildings, frequented by numerous persons. This dust likewise affords good fuel for heating ovens, in which bread and other substances are to be baked....We understand, from gardeners, that if the fresh dust, obtained after sawing oak-timber, be scattered on gravel-walks in February, or at an early period in March, it effectually prevents the growth of weeds: and if it be perfectly rotten, together with blood and quick-lime, it proves an excellent manure.

The saw-dust of fir and pine-trees contains a very large proportion of resinous and saponaceous matter; so that it has been usefully employed by the country-people of Sweden and Norway, as a substitute for soap, in washing coarse linen.

[SAW-MILL.....Mr. Moses Coates, of Chester County, Pennsylvania, has obtained a patent from the United States, for an improvement in saw-mills, for accellerating the sawing of timber into boards and scantling. It would be impossible, without a plate, to give an intelligible description of the machinery, neither would it be of advantage to the reader considering, that the right of erecting it, must first be purchased from the patentee, who will furnish the necessary instructions; we shall therefore only say here on the authority of the inventor; that a log 20 inches diameter, and 14 feet long, was sawed into inch boards, and the gate shut down, without being moved or acted upon by any other means, than that supplied by the water, acting upon the mechanism of the mill; and the whole time employed in moving the log back, and the saw entering after each successive run, did not exceed half a minute.]

SAW-WORT, or *Serratula*, L. a genus of plants, comprising 18 species; two of which only, act cording to Dr. Smith, are indigenous; namely:

1. The *tinctoria*, or Common Saw-wort, is perennial; grows in woods and on pastures, where it flowers in the month of July...This plant is employed by dyers, to impart a yellow colour; but, being inferior to the Dyers-weed, its use is chiefly confined to the coarser woolen cloths, and as an ingredient in other dyeing drugs....In combination with indigo, the Common Saw-wort strikes a permanent green colour. Its leaves readily yield a brownish-yellow decoction, which, on diluting it with water, changes to a brighter tinge; and, by adding a solution of pure pot-ash, acquires a darker shade: but, on dropping into it a little of the spirit of sal-ammoniac, becomes reddish-brown; which may again be rendered of a golden tint, by the addition of pure water. On the whole, Porner observes, that alum and gypsum appear to be best calculated for extracting a fine yellow colour from this plant; which the Germans industriously cultivate....Goats eat the species, but horses do not relish it; and it is totally refused by sheep, hogs, and cows.

2. The *arvensis*, Corn Saw-wort, or Way-thistle, thrives in corn-fields and on road-sides: it flowers in the month of July; and is often a very troublesome weed. ....When burnt, the ashes of this plant yield a very pure vegetable

alkali, or pot ash; on which account it deserves to be propagated in the vicinity of glass-houses and soap manufactories...Neither cows, horses, nor swine eat this vegetable; but it is relished by goats: its young and tender tops are occasionally devoured by horses..... While young, the Way-thistle is eagerly consumed by sheep: when bruised and mixed with bran, this weed affords excellent food for every species of cattle. Its seeds are enveloped in large downy crowns; which, according to BECHSTEIN, may be advantageously combined with wool, and thus converted into blankets and coarse cloth; nor are they less useful for stuffing pillows, bolsters, and matresses.

[*Serratulus Spicata*, is a native plant of the United States, and a very useful diuretic; it is called *lobelia*, by the people of the western counties in this state.]

SAXIFRAGE, the COMMON, or WHITE, *Saxifraga granulata*, L. an indigenous plant, growing on dry meadows and pastures, where it flowers in the month of April or May. Its perennial root consists of several small bulbs, which are externally of a reddish colour, and from which arise long hairy foot-stalks, that are furnished with downy, kidney-shaped leaves.....The stems are thick, hairy towards the bottom, somewhat branched, and from 12 to 24 inches in height, having a few small leaves, which sit closely to the stalk. The flowers grow in small clusters, and are furnished with five white petals, that inclose ten stamina and two styles: the seeds are very numerous, small, and black.

According to LINNÆUS, this plant possesses an acrid, pungent taste, which, however, is not confirmed by the accounts of later botanists: on the contrary, the grains, or tubercles forming the root, and also the leaves, are equally devoid of any *sensible* quality.

The Common White Saxifrage was formerly in great request, for its supposed efficacy in curing nephritic and gravelly complaints: at present, it is totally disregarded; and we should neither have given a coloured engraving, nor described the specific characters of this plant, if it were not uniformly discovered in soils, beneath which a bed of GRAVEL will be found, at no considerable depth. Hence it affords a certain guide, by which surveyors and landed proprietors may be directed in digging for that useful fossil, especially in places where other stones cannot be easily procured, for repairing public roads.

SAXIFRAGE, the common, Great, and Dwarf Burnet. See ANISE.

SCAB, or SHAB, a disorder peculiar to sheep: it is attended with an intense itching and scabby eruptions on the skin, occasioned by an impure state of the blood; and being most prevalent in wet land, or during rainy seasons. As this disease is generally believed to be infectious, the animals under its influence ought to be carefully separated from the flock.

Various remedies have been devised for the cure of the scab: the most common is that of washing the part with a decoction of strong tobacco in water, to which is added a small portion of oil of turpentine. Another application consists in rubbing the sheep with tobacco-water, sulphur, and alum

boiled together, if the eruption extend over the whole animal; but, if it be only *partial*, a mixture of tar and grease will be sufficient.

In an *inveterate scab*, the anonymous author of the "*Farmer's Calender*" recommends sulphur and bay-salt, or purging salts, to be given internally, and the distempered beast to be dressed with a strong mercurial ointment mixed with *Mel Ægyptiacum* (for the preparation of which, see vol. iii. p. 121); or to be washed with a lather of black soap, or sublimate-water, lime-water, and oil of turpentine. The treatment, stated under the article FLY-STRUCK, is likewise said to be efficacious in this malady.

The following preparation is stated in the "*Cardiganshire Landlord's Advice to his Tenants*," as being effectual in removing the scab, namely: Take one pound of tobacco, six quarts of beef brine, six penny-worths (or about one ounce) of white arsenic, and one pint of oil of turpentine. These ingredients are to be mixed with a small portion of tar, and boiled: previously to the use of this liniment, it will be necessary to *break* every scab, and the sheep must be well rubbed, so that the liquid may thoroughly penetrate.

In some places, the animals affected with the *scab*, are usually washed with *human urine:* but such treatment is pernicious; for, if the disorder be only partial, it will in the course of two or three days spread as far as the sheep may have been wetted.

There are various other expedients suggested for the cure of this eruption; but we believe the following to be one of the most efficacious: it was communicated by Sir JOSEPH BANKS, Bart. to the *Society for the Encouragement of Arts*, &c. in 1789. He directs of pure quick-silver 1 lb.; of Venice turpentine and common oil of turpentine half a pound each; and of hog's-lard four pounds, to be triturated in a mortar, till the mercury be completely incorporated with the ingredients.

The method of using this ointment is as follows: The head of the sheep must first be rubbed; after which a furrow is to be drawn with the finger, from the region between the ears, along the back to the point of the tail, so as to divide the wool, till the skin be exposed to the touch. Next, the finger, being slightly dipped in the preparation, should be drawn along the skin. Similar lines should farther be opened down the shoulders and thighs, as far as the wool extends; and, if the animal be considerably infected, two other furrows are directed to be traced, parallel to that on the back, and one should likewise be drawn downwards, on each side between the fore and hind legs.

After this application, the sheep may be turned among the flock, without any danger of the infection being communicated; because, in a few days, the blotches will dry up; the itching will cease; and the animals be completely cured; nor have any instances occurred, in which such unction has been in the least injurious.....Sir J. BANKS, however observes, that the external remedy ought not to be delayed to a later period than Michaelmas.

SCABIOUS, or *Scabiosa*, L. a

genus of plants comprising forty-two species, three of which are indigenous and perennial, namely:

1. The *succisa*, or DEVIL'S-BIT SCABIOUS, grows in fields and pastures, where it flowers from June till August. According to LINNÆUS, the dried leaves of this plant are employed to impart to wool a yellow or green colour; the latter of which, however, is more completely extracted from the blossoms, and may be communicated even to linen. A decoction of this herb is likewise of service, when applied, by way of fomentation, to the hoofs of horses injured by nails. Cattle derive nourishing food from this vegetable.

2. The *arvensis*, or FIELD SCABIOUS, grows in similar places, and flowers in the month of July or August. This herb, is according to Dr. WITHERING, slightly astringent, bitter, and saponaceous; it is eaten by sheep and goats, but neither relished by horses nor cows. From the Field Scabious, a green dye is likewise obtained for wool; and its reddish blue flowers are fondly visited by bees.

3. The *columbaria*, or SMALL SCABIOUS, grows on dry hilly pastures, and blows from June to September. The blueish-lilac flowers of this species are also very grateful to bees; and the whole plant is eaten by horses, goats, and especially by sheep.

SCALDS, a term applied to burns, occasioned by boiling water, or any other corrosive mineral acids improvidently applied to the skin.

Different modes of treatment have been adopted, in order to mitigate the pain which generally attends such accidents. Thus, frequent effusion of water, or immersion of the scalded part in that fluid, has been found very serviceable; nay, even the application of ice has occasionally been productive of great benefit, when the skin was *not broken*, but in the contrary case, an emollient poultice should be immediately applied, and the treatment be similar to that of a fresh wound. If, however, the former method be proper, in such case it ought to be continued till the patient shivers from the cold; after which the scald must be continually moistened with lime-water; and a liniment of this liquid and sweet-oil, beaten together, must be spread over the sore. By this management, the most extensive scalds are speedily healed: it may likewise be pursued, where any part has become *chafed*, in consequence of hard riding. Vinegar, both in a warm and cold state, has also been successfully applied to scalded parts; and, latterly, the oil of turpentine, with such effect, that the pain was frequently removed in an hour, and blisters were effectually prevented. In either case, we conceive, the skin ought to be *sound*.

SCALD-HEAD, or *Tinea capitis*, a disease chiefly incident to children, born of scrophulous parents: it is infectious only by contact, and appears to be seated in the roots of the hair, which protrude numerous small vesicles emitting an ichorous humour, and at length degenerating into ulcers that form a dry scab, or hard crust, sometimes half, or a whole inch in thickness, spreading gradually over the whole head.

Causes....This malignant eruption often arises from uncleanli-

ness, improper or coarse food; but more frequently from the contaminated humours of *wet nurses*.

Cure.....The principal attention should be directed to the removal of the diseased parts, either by shaving or cutting off the hair, or by applying an adhesive plaster, made of equal parts of bees-wax, pitch, and mutton-suet. After removing this detergent application, it will be necessary to wash the head with sub-tepid soap-water; to plunge and clease the whole body in a lukewarm bath, frequently; and, in every respect to observe a very moderate and wholesome diet: hence salt-meat, pickles, bacon, pork, and even fish, will be improper. At the same time, the bowels should be regulated by the mildest laxatives; such as a few grains of rhubarb, with a dram of cream of tartar. Numerous and whimsical remedies have been employed in this complaint, with various degrees of success; but we shall state only such as may be resorted to with safety.... Of this description is the Sharp Dock (*Rumex acutus*, L.) which may with advantage be used in decoctions, both externally (with the addition of soap converted into a lather) and internally as a diet-drink; for a concentrated extract of this medicinal plant, if taken in doses of one or two tea-spoonfuls mixed with honey or treacle, not only operates by the urinary passages, but also promotes evacuations by stool. The leaves of the Common Colts-foot (*Tussilago Farfara*, L.), either alone, or in combination with the Sharp Dock, may be given with equal benefit.....It would disgrace the healing art, to relate the various and absurd remedies that have strenuously been recommanded by medical writers, for the cure of the scald-head: hence we shall observe, that the most melancholy effects have often followed the use of repellent plasters and ointments, such as loss of sight, deafness, palsy, emaciation, or malignant eruptions and ulcers in other parts of the body.

If the treatment before suggested, prove unavailing, it may be concluded that the disease proceeds from an hereditary taint, and requires more active remedies; for instance, mercurials, for the prescription of which, a professional man ought to be consulted....In young infants, however, it is frequently cured by changing the nurse, or weaning the child, and removing it from a moist or marshy, to a dry and airy situation; because moisture, in our opinion, is one of the causes predisposing children to this malady. Should the itching of the head become very troublesome, it may generally be allayed by gently rubbing the spot with equal parts of sweet-almond-oil, and the juice expressed from the leaves of the Common Burdock, previously simmered together over a moderate fire, till they become intimately blended into a soapy liniment, on adding a few grains of pearl-ash. [See articles KALMIA, MELIA.]

SCAMMONY, a concrete gummy-resinous juice obtained from the roots of the *Convolvulus Scammania*, or Syrian Bindweed, an exotic plant, growing in Asiatic Turkey. The best Scammony is imported from Aleppo, in light, spongy, friable masses, of a shining blackish ash-colour. It possesses a faint, unpleasant smell, and a bitterish, pungent taste.

In its medicinal effects, Scam-

mony is an efficacious, but violent purgative; but, if triturated with sugar, almonds, or gum-arabic, it becomes sufficiently mild, and safe in its operation. It may also be dissolved in a strong decoction of liquorice, then decanted; in which form it is not disagreeable to the palate, and proves a gentle laxative. The common dose of Scammony is from three to twelve grains.....If accidentally too large a portion of this drastic medicine should have been swallowed, the most effectual antidotes will be copious draughts of mucilaginous preparations, or an immediate emetic.

[The true Scammony plant was found in Sussex county, (N. J.) last year by a friend, who communicated the fact to the editor.]

SCARLET FEVER, is a contagious inflammatory disease, attended with a bright-red efflorescence of the skin, which appears on the third or fourth day, with a slight swelling of the face: the redness gradually spreads, but vanishes after three or four days, when the scarf-skin generally peels off in branny scales. Though a sore throat in most cases occurs, it is by no means a necessary symptom.

The proximate cause of this malady, appears to be an unknown contagious matter propagated by the atmosphere; though the body may be predisposed to receive the infection, from sudden changes of cold and heat, rainy weather, and indigestion.

Cure:...In this formidable disorder, which often terminates fatally in three or four days, emetics should be early and repeatedly administered; as such evacuations, according to Dr. WITHERING, and our own experience, are the remedy suggested by Nature; after which diuretics, such as vinegar and honey, with a few grains of nitre, will be of essential benefit. Great care, however, is necessary to avoid whatever may induce a looseness of the bowels, which is seldom salutary in this complaint. A gargle consisting of equal parts of lime-water and vinegar, or barley-water and honey acidulated with vitriolic acid, will be very useful in reducing the inflammation and swelling in the throat. The diet must be light and diluting, while the patient ought to abstain from all animal food; but he may take frequent draughts of thin gruel, barley-water, and the like, with currant-jelly. His body should be kept moderately warm in bed; and the room fumigated with vinegar and camphor, placed in a proper vessel over a burning lamp, in order to purify the air. When the fever and eruption cease, a dose or two of mild aperient medicines, may be given with safety and advantage.

Should the legs be remarkably swollen, after the other symptoms have subsided, a decoction of the Seneka root with vinegar and honey (at the same time bathing the lower extremeties, or the whole body, in warm water) will afford the greatest relief. But, if the inflammation in the throat threaten suffocation, or be attended with violent fever, medical advice should be instantly procured; as the progress of this epidemic is uncommonly rapid, and often mortal.

[This is a common disease in the United States, and frequently very mortal. In addition to the above remarks, the reader is referred to Dr. RUSH'S works, for an

able account of the disease, and the most successful method of cure.]

Sciatica. See Rheumatism.

SCIRRHUS is a hard, unequal tumor, which occasionally appears in different viscera, such as the liver and womb, but more frequently in the glandular parts, for instance, the breasts, arm-pits, and about the neck. It mostly arises in consequence of inflammation, though it may also occur spontaneously, in persons of a heavy, phlegmatic, or scrophulous habit. A scirrhus may likewise be gradually induced by passions, especially those of a depressing nature; by gross food; the abuse of acids; external violence; sudden cold; suppressed evacuations, and various other causes.

The degree of danger, attending scirrhous indurations, varies according to the nature of the diseased part, and state of the disorder; though an internal tumor is always more dangerous and difficult to be removed, than one situated externally; as the former may be productive of great injury to the animal frame, by compressing the adjacent parts, whence palsy, colic, &c. are the concomitant evils. As long, however, as the swelling remains in an indolent state, no immediate danger need be apprehended; but, when it once becomes painful, or ulcerated, there will be just reason to fear that it may change into a *Cancer*.

Treatment:....If the patient be in other respects healthy, and the tumor but recently formed, its dispersion may be effected by the internal use of resolvents; for instance, the mildest preparations of mercury (calomel), and antimonial wine, with the decoction of the woods: externally the warm gums, in plasters, such as sagapenum and ammoniac; or the volatile liniment, or even a solution of sal-ammoniac in vinegar, have often been productive of good effects; but, if the patient be advanced in years, or the swelling painful, great caution becomes necessary; lest, by any improper application, the disorder assume a cancerous taint. Various other more potent remedies, such as the hemlock and foxglove, have been recommended, with a view to effect a resolution; but they have numerous instances failed of success. In desperate cases, therefore, where medicines proves fruitless, the tumor must be timely extirpated by the knife, provided that the situation of the parts admit of an operation, and a free discharge. But, if neither of these objects can be attained, it will be advisable to promote the formation of an *abscess*, as the only means of removing the complaint.

If the liver be thus diseased, it may be ascertained by the following symptoms: tumor and hardness on the right side about the short ribs; pain, particularly when lying on the opposite side; emaciation of the upper parts, and dropsical swelling of the lower extremities. In this case, the bowels should be regularly opened by the mildest laxatives; while the patient's diet ought to be bland and nourishing. The nitric acid, in the proportion of one dram per day, diluted with three or four pints of water, with the addition of some syrup of marsh-mallows, to be used as the common beverage, has lately been prescribed

with great advantage; but of which we have not had sufficient experience. Hence we would give the preference to the acetated kali, or regenerated tartar of the shops, to be taken in doses of 2 or 3 drams per day, dissolved in water; being a medicine from which the greatest benefit has often been derived.

With respect to the analysis of a new remedy against scirrhus and cancer (mentioned in the first vol.) we understand, that though the administration of this pretended specific was, in several cases, apparently attended with good effects, yet there is no attested instance, in which it has completed a cure: on the contrary, the patients who credulously resorted to this *professional empiric*, are said to have uniformly been disappointed in their expectations, so that we may save ourselves the trouble of analyzing a NOSTRUM which its supposed inventor (though he has offered to submit it to the test of chemical inquiry), carefully carries about in his pocket, and administers to the patient in his presence.

SCORZONERA, the COMMON, or *Scorzonera Hispanica*, L. an exotic plant, which has long been raised in British gardens for culinary purposes, and especially as an ingredient in soups, on account of its palatable and nourishing roots. It is propagated by seeds: the plants should be carefully thinned, and cleared from all weeds; for, otherwise, they will never attain any considerable size.

The root of the scorzonera ought, before it is boiled, to be deprived of its black rind, and immersed in cold water for half an hour: thus, its flatulent effects will be greatly prevented, and it will also become less bitter.

[To raise this plant. In the spring dig the earth one foot deep; open trenches four or five inches in depth, into which put about one and half inches of well broken and rotten manure; cover this in part with the earth taken from the trenches, leaving enough to cover the seeds about one inch. The trenches must be dug at the distance of nine or ten inches from one another: and the seeds planted three or four inches a part.

The roots must not be gathered until the year after the seed has been sown. They last from three to four years, according to the quality of the earth, and the care bestowed on them.

MAWE says, the roots will attain perfection in autumn, and continue good all winter 'till spring following. He directs the seed to be sown in April, and not before: to plant *the roots five or six inches* apart.]

SCOTCH-FIR. See FIR-TREE.

SCRAMBLING-ROCKET. See MUSTARD, the Hedge.

SCRATCHES, a distemper in the heels of horses.

Under the article GREASE, we have already stated the method which is generally pursued in the treatment of this disorder: we shall therefore only observe, by way of supplement, that if the scratches prove obstinate, and the sores be deep, the following healing ointment may with advantage be applied: Take of Venice turpentine 4 oz. quicksilver 1 oz. incorporate them properly, and then add honey and mutton-suet, of each 2 ounces; anoint the diseased parts once or twice a day; and, if the

animal be of a full or gross habit, bleeding and purging, together with proper alteratives, must be resorted to; in order to correct a vitiated state of the blood. Should, however, any cavities be formed in the horse's heels, they must first be laid open; as it is absolutly necessary to apply the dressing to the bottom, in order to effect a radical cure.

[SCREW, Mr. Voight, chief coiner in the mint of the United States, has invented an engine for turning screws of any given diameter, and of any number of threads, to an inch. This invention was first designed for cutting fusees for watches, so as uniformly to adjust them to the length of the main-spring...a thing hitherto very difficult in practice, and without which it is impossible a watch can keep *regular time*. By the aid of this machine a person of common mechanical abilities, and without any knowledge of mathematics, may adjust the fusee to the spring with the greatest exactness.....or turn metalic cylinders and cones of any length or diameter, to a mathematical certainty.

We understand that Mr. Voight, from patriotic principles, has no intention of obtaining a patent, but to leave it open to his fellow citizens.]

SCROGS. See SLOE-TREE.

SCROOBY-GRASS. See SCURVY-GRASS, the Common.

SCROPHULA, or EVIL, is a swelling of the conglobate glands, particularly about the neck and ears; though sometimes extending to the arm-pit and the groin. In its progress, the joints and bones are liable to be affected.

Scrophulous tumors may be distinguished from scirrhous, by their soft and moveable state, they sometimes disappear in one part, and rise again in another. This complaint, however, is not confined to the external parts, but occasionally attacks the lungs, mesentery and other organs; in which cases a swelling of the upper lip will indicate the concealed evil.... Children afflicted with this malady are generally of a florid complexion; they have a soft skin and tumefied abdomen: such individuals attain to a maturity of understanding superior to others of the same age. In some countries, the disease is endemial: thus, it is uncommonly prevalent in Britain, Holland, Switzerland, and Carinthia.

Scrophula often frustrates the efforts of the healing art; though it seldom proves fatal, while it is confined to the external glands; but, if it extend its influence to the pulmonary organs, it frequently produces tubercles, and eventually consumption. When the joints are diseased, it occasions tumors, stiffness of the limb, ulcers, decay of the bones, and often emaciation of the body, till death closes the fatal scene.

Causes: Whatever tends to produce a viscid lymph, and to debilitate the constitution in general, such as coarse and acid diet, especially pastry; moist air; damp habitations; colds; want of exercise; impure water; and the vitiated milk of nurses; all may engender the *evil*. Farther, when the scrophulous taint is once introduced into the constitution, it generally appears after the small-pox, measles, and even in consequence of external injuries. Whether this disorder be hereditary and contagious, is a point on which the opinions are divided; but whether it

may, or may not, be communicated by contract, prudence would dictate, that healthy children should not be suffered to sleep with scrophulous persons.

Cure :....A great variety of remedies has been devised for removing scrophula: the principal difficulty in extirpating this malady, however, arises from the circumstance, that it may remain concealed for a long time, and thus become deeply rooted in the constitution, before its effects are evident. Hence, we shall confine our account to such remedies as have generally been attended with salutary effects.

In order to resolve the viscid lymph, and to strengthen the system, the use of Peruvian bark, in the state of powder, combined with hemlock, forms an excellent remedy; but the proper doses ought to be regulated by a medical practitioner. Sea-water and sea-bathing, as well as moderate exercise, especially in a warm, serene atmosphere, are alike conducive to recovery. During this course, the bowels should be gently and regularly opened; the diet ought to be light, consisting of nutritive food, easily digestible; and the sleep must also be moderate, not exceeding seven or eight hours in adults, and nine or ten hours, in children. Frictions will be serviceable, by promoting the circulation of the fluids, and tending to strengthen the solids. Hemlock-plasters applied to the tumors, and burnt sponge combined with small portions of black pepper, taken before breakfast, have frequently been of service in reducing them, especially if assisted by sea-bathing..... Mercurials and antimonials are powerful, though precarious, remedies; and if the former be employed in consequence of medical advice, they should never be given in such quantities as to induce salivation, which would doubtless aggravate the disorder. Milk-whey, with the DEAD NETTLES, has also occasionally been found useful; but we forbear to mention the absurd sympathetic remedies formerly resorted to, for the cure of the *evil*; as these superstitious practices are, at present, in vogue only among the vulgar.

If, however, none of the medicines before enumerated, have the effect of dispersing the swellings; on the contrary, if a *suppuration* of the tumors be likely to ensue, they should never be opened, till the tumid indurations are softened; or, it will be more safe and advisable to suffer them spontaniously to break, without any application of emollient, or other poultices; as the subsequent healing of the ulcers will thus be greatly promoted.

The *nitric acid* has, lately, been extolled as an efficacious remedy against hard indolent swellings, and particularly those of a scrophulous nature: in the latter cases, it is given according the age of the patient, in doses of from 20 to 60, and even 80 drops, in water sweetened with honey; and which must be taken in the course of 24 hours.

Should it occasion nausea, and injure the enamel of the teeth, these inconveniences may be remedied by diminishing the number of drops, and adding more sugar or honey. In some instances, this acid has proved beneficial; but it requires more time, positively to ascertain its effects.

SCULL, is a conjunction of bones, eight in number, surround-

ed by a membrane called the *pericranium*, and forming a cavity for the brain ; which is thus completely inclosed and defended:...In an infantile state, the scull is of so delicate a texture, as to admit of being moulded into almost any form ; a circumstance, on which the shape of the heads of different nations chiefly depends ; but, in an adult state, they acquire so concrete a form, as to represent one solid bone, and are afterwards more easily broken than separated....The edges or margins of the bones are distinguished by certain lines, called *sutures*.

The principal injuries, to which the scull is exposed, proceed from external violence ; for instance, blows and falls, by which the bones may be *fractured*. The danger attending such accidents, varies according to the more or less complicated nature of the fracture, and the relative health of the patient : for, if his constitution be debilitated, or the humours be vitiated, the most trivial contusion of the head may prove fatal.

The symptoms by which a fracture of the scull may be ascertained, are as follows : the points of the bones may sometimes be felt; the patient is afflicted with giddiness, drowsiness, stupefaction, loss of sight ; and, when the concussion has been violent, blood is discharged from the eyes, nose, and ears ; which last circumstance generally denotes a compression of the brain. If, however, several of these appearances concur, and the diseased part cannot be distinguished, the head should be deliberately, but firmly pressed in every direction ; thus, the patient will, in most instances, point out the seat of the injury, by his own sensations of pain or uneasiness, when the fractured part is touched.

As these dangerous cases require the application of the trepan, without delay, we shall only state a few particulars relative to the dietetic treatment, after the operation is performed. The patient ought to be kept in the most quiescent state : his bowels must be regulated by gentle aperients, such as are the most agreeable to the taste and stomach, in order to avoid vomiting ; the food should consist of the lightest and most digestible vegetables ; while he must cautiously abstain from all fermented and spirituous liquors, and drink barley-water, or other diluents, in which a few grains of nitre have been dissolved.

A small scar generally remains after the wound is healed ; but, if a considerable part of the integuments have been lacerated, or destroyed, the bone will be covered only by a thin skin, over which the convalescent ought to wear a round plate of tin or silver, adapted to the purpose, and lined with flannel, to protect it from external injury.

SCULL-CAP, the COMMON, or BLUE, or HOODED WILLOW-HERB, *Scutellaria galericulata*, L. a native perennial plant, growing on the banks of rivers, and the borders of ponds ; flowering in the month of July or August....Its square stem attains the height of two feet : the herb is eaten by cows, sheep and goats ; but is refused by horses and hogs....CARTHEUSER, a German writer, informs us, that the whole of this astringent vegetable may be employed for dyeing black, with the addition of green vitriol.

SCURVY, or *Scorbutus*, denotes a putrescent, or rather dissolvent

state of the blood. This term is often misapplied to a variety of eruptive complaints, which have no specific names.

The scurvy has been divided into several species, an investigation of which would be foreign to our purpose; especially as the *land-scurvy* only differs from the *sea-scurvy*, by being less severe.

Symptoms:...Debility; dejection of spirits; bleeding and decay of the gums; fetid breath; spots of various colours, but mostly of a livid hue, on the thighs, legs, and particularly at the roots of the hair. In the progress of this malady, blood issues from different parts of the body, and ulcers are formed, which emit only an ichorous humour, and are with difficulty healed. The patient is now subject to great pain and fainting, on the least motion; or, when exposed to the fresh air, his feet swell; breathing is impeded: and at length diarrhœa, dropsy, or fainting, terminates his sufferings.

Causes:....Low, and damp habitations; an inactive life; suppressed or excessive evacuations; impure air; inattention to cleanliness; depressing passions; coarse, unwholesome, salted, and smoked food, when taken for a considerable time, and without a proper share of vegetables; foul water; want of malt liquor.....to the influence of all which causes, seafaring persons are peculiarly subject, as well as the inhabitants of northern climates.

Cure:.....It is evident from the preceding statement, that the principal relief must be afforded by a diet and regimen exactly opposite to the cause. Thus, if the scurvy originated from low, damp, or confined air, the patient must be removed to an open, dry, and warmer situation: if it arose from inactivity, a sedentary life, or depressing passions, recourse should be had to exercise in the open air; and he should endeavour to divert his mind by cheerful company and pleasing amusements. Suppressed evacuations must be restored with precaution, and by mild aperients, the most eligible of which are, tamarinds, prunes, cream of tartar, and rhubarb.....When the scurvy proceeds chiefly from the long-continued use of salted provisions, it will be necessary to take medicinally, large portions of the juice of lemons, oranges, limes, tamarinds; water-cresses, brook-lime, scurvy-grass, and fresh vegetables of every description; but, where the latter cannot be procured, pickled or preserved cabbages, cucumbers, onions, gooseberries, and other fruits, as well as horse-radish and mustard, may be employed with equal advantage. At first, however, the patient ought to eat or drink the remedies above specified with great moderation; in order to avoid a diarrhœa or flux. For common beverage, good cyder, perry, whey, spruce-beer, or a simple decoction of the spruce-fir (of which last, two pints are to be drunk every day) will prove highly beneficial: with the same intention, Bishop Berkley recommends *tar-water*. .....One of the most efficacious anti-scorbutics, however, is *Saur Kraut*, which alone has often checked the progress of scurvy, under the most alarming appearances.... See also Wort.

Considerable benefit has, in several instances, been derived from a decoction of the Water Dock (*Rumex aquaticus*, L.) by boiling one pound of the root in six pints

of water, and adding an ounce or two of crystals of tartar, till one-third part of the liquor be evaporated; of which, from half to a whole pint, is to be drunk every day.

If, during this vegetable course, the body should be costive, and the skin dry, the mild aperients before mentioned, and warm bathing with aromatic plants, may be resorted to with advantage; though the latter must be omitted, when there is any apprehension of hemorrhages. ...The mouth should be rinsed with a decoction of the Peruvian bark, to which a small portion of tincture of myrrh may be added: farther, lint dipped into a simple decoction of the bark, and applied to the ulcers, will be found very useful. Lastly, if the limbs be swollen, or the joints stiff, it will be advisable to foment them with warm vinegar; or to bathe the parts affected in tepid water.

SCURVY-GRASS, or *Cochlearia*, L. a genus of plants comprising eight species, five of which are indigenous: and the principal of these are:

1. The *Armoracia*. See HORSE-RADISH.

2. The *officinalis*, COMMON SCURVY-GRASS, or SCRUBY-GRASS; growing on sea-shores, and in mountainous situations, where it flowers in the months of April and May...When cultivated in gardens, this maritime plant retains its properties, without any sensible change. It possesses a considerable degree of acrimony, which resides in a very subtle essential oil: and, as an anti-scorbutic, its effects are sufficiently ascertained. In the pituitous asthma, and chronic rheumatism, the scury-grass is a powerful remedy. It is likewise a pungent stimulating medicine, which may be advantageously employed for promoting the fluid secretions. .....A distilled water, and a conserve, are prepared from its leaves; and the expressed juice is prescribed with that of oranges, among other anti-scorbutics....It may also be used as a salad...Cows eat this plant, but it is refused by horses, goats, and sheep.

3. The *Anglica*, ENGLISH SCURVY-GRASS, or SPOONWORT, grows on sea-shores, in muddy soils, or salt-marshes, and flowers in the month of May....This species possesses similar properties with the preceding, but in an inferior degree.

4. The *Coronopus*, COMMON WORT-CRESS, or SWINE'S-CRESS, thrives in corn-fields, on rubbish, and road-sides; blows from June till August....It is a palatable salad-herb, on which account the Germans cultivate it in gardens.

These different species of scurvy-grass may be propagated by seeds, which are to be sown in July, in a moist soil; because, if committed to the ground in the spring, they seldom prosper:..... when the young plants appear, they should be thinned, so as to leave them at the distance of about six inches apart. Those of a proper size may then be transplanted; and, in the succeeding spring, they will be fit for use: the remaining plants may be left for seed, which will attain to maturity in the month of June.

SCURVY-GRASS, the Scottish. See BINDWEED, the Sea.

SCYTHE, or SITHE, an implement of husbandry employed for the purpose of cutting grass, and also for the mowing of corn.

The well-known *Hainault*, or *French Scythe*, for reaping wheat, has of late years met with many

advocates in Britain. It consists, according to the description given by Dr. TEMPLEMAN, of a short blade, being about one-third of the length of those commonly used in England; with a wooden handle to be held in the right hand, having a bend and a broad rounded piece at the upper end, for the support of the arm. Farther, an iron hook is fixed to a staff, four feet in length, made of oak or ash, to be used with the left hand, with a mortise near the end, for the conveniency of the husbandman's carrying the scythe on his shoulder. On the handle of the scythe, and staff of the hook, at about half a yard from the bottom, are placed leather loops for the fingers, to keep the two grasps at proper distances from the ground.

[A representation of the Silesian scythe and cradle, is given by Dr. WILLICH; it has a straight handle and four teeth, parallel to the blade. The American tool it is well known, has *five* teeth; and the handle is somewhat crooked, which tends greatly to diminish the labour in using it, and to keep the grain upon the long teeth, until the reaper throws it off. The heads of the grain are all laid one way. The teeth are made of *ash;* that wood being tough, and yet yielding gently to pressure.]

SEA, strictly speaking, signifies a large body of water, which is connected with the ocean, and partly encompassed by land; such are the Baltic, and Mediterranean Seas: though the term sea is, also, frequently employed to denote the immense fluid mass that surrounds the globe.

It appears from actual observation, that the sea, in some parts of the world, daily encroaches upon the land; in consequence of which, valuable tracts will, in the course of time, be completely inundated: hence it has been deemed necessary to resort to embankments, or artificial dams, in order to repel the inroads of this element; and with a view to facilitate such national object the *Society for the Encouragement of Arts*, &c. have offered liberal premiums. Among the successful candidates, was Mr. JOHN HARRIOTT, of Rochford, Kent, who effectually secured 142 acres of land from the sea, by means of banks; and on whom, in 1785, they conferred their gold medal. In 1787, they bestowed their silver medal on the Rev. HENRY BATE DUDLEY, for embanking, draining, and freeing from the encroachments of the German Ocean, between 3 and 400 acres of land, that was formerly a stagnant marsh; but which, in consequence of his exertions, was rendered worth 20s. per acre, on a lease for twenty-one years. In the year 1800, the Society adjudged their gold medal to the same gentleman, for his farther endeavours in that laudable pursuit. The tract, thus obtained, amounts to 206 acres; and is defended from the ocean by an embankment of earth only, and which extends nearly one mile in length. It was commenced on a base of 32 feet, and carried up to the height of seven feet, for the more easy ascent and descent of the waves; a plane of five feet being left on the top, and the *land-side* of the embankment made as nearly perpendicular as the security of the base would permit. This land is divided into four extensive marshes, by means of twelve-feet ditches; and all superfluous moisture is removed by numerous small

drains or rills, that are cut in different parts of the tract....Consistently with our limits, we cannot descend to particulars on this interesting subject; but, as numerous practical hints may be derived from the account of the different expedients ingeniously adopted, the inquisitive reader will consult the 4th, 6th, 14th, and 18th vols. of the Transactions of the Society before mentioned; where he will meet with a clear and explicit narrative.

SEA-AIR, denotes that part of the atmosphere, which is incumbent on the sea.

Experience evinces, that this air is salubrious, and singularly beneficial in the cure of particular diseases: hence, a voyage has often been successfully undertaken by consumptive patients, and such as were afflicted with asthmas, spitting of blood, and dropsies; especially if directed to a warmer country. These excursions have, likewise, been found very serviceable during the sickly season that annually prevails in the West-Indies, and other hot climates. Dr. LIND (*Essay on the Diseases incident to Europeans in Hot Climates*, 8vo. 1768) has therefore judiciously proposed a "floating factory," or *infirmary ship*, to be stationed at a small distance from the shore, as being an effectual mean of preserving numerous lives. He observes, that there are certain fevers, which require an immediate change of air; as, otherwise, the most powerful and appropriate medicines will prove ineffectual; and, if a patient were removed to such vessel, as soon as the symptoms of the disease appear, he is of opinion, that the latter will not only be milder, but the cure will be facilitated; and the recovery of the patient more completely ensured. In consequence of this preservative measure, the constitution will be gradually inured to the climate; and thus be rendered less susceptible of injurious impressions, either from the atmosphere, or the exhalations of the soil.

SEA-ANEMONE, or Sea-nettles. See ANIMAL FLOWER.

SEA-CALE. See KALE, the Sea.

SEA-CABBAGE; or Sea-Colewort. See CABBAGE, the Common.

SEA-CUSHION; or Sea-Gilliflower. See THRIFT, the Common.

SEA-GRASS. See SALTWORT, the Jointed.

SEA-HOLLY. See ERYNGO.

SEA-LAVENDER. See LAVENDER-THRIFT.

SEA-PARSLEY. See Scottish LOVAGE.

SEA-PARSNIP. See SAMPHIRE, the Prickly.

SEA-SICKNESS, a convulsive affection of the stomach, attended with great nausea and vomiting: it is occasioned by the irregular motion of the vessel.

The sea-sickness generally attacks persons unaccustomed to voyages on the ocean, particularly if they embark in a small vessel, which is not deeply laden. On the other hand, passengers in very large ships are less violently affected; as the waves make only a slight impression on the latter. People advanced in years, and also children (especially, if they be of a dark complexion) are less liable to this complaint than those who are in the prime of life, and possess a fair skin. Its duration is very unequal; in general, only for one or two days; though it sometimes continues for weeks, or months, and even during the whole

voyage: in which latter case, it induces head-ach; fever; intense thirst; a quick pulse; and a total inability to retain either solid or liquid food on the stomach;.....affections, that are always very difficult to remove.

But, though sea-sickness be thus irksome and distressing to the patient during its continuance, it has often proved highly beneficial in numerous diseases, particularly in asthmatic and pulmonary cases: very few instances, indeed, have occurred, in which fatal consequences have resulted from this temporary complaint.

Among the numerous remedies devised, with a view to alleviate this debilitating indispostion, one or two draughts of sea-water have been found very serviceable; for, though extremely disgusting, that fluid will clear the first passages, if they be foul or oppressed, and thus afford effectual relief, when the nausea and sickness which it necessarily occasions, have abated. The frequent application of æther to the temples and nostrils, together with a tea-spoonful of that liquor, diluted in a glass of water, and occasionally taken, has likewise been attended with good effects.

In order to mitigate, and if possible, to prevent the violence of that complaint, it has farther been recommended, never to embark, immediately after meals; and, when on ship-board, to partake very moderately of food, which ought to consist of bread and fresh meat (at least as long as this article can be procured), to be eaten in a *cold* state, with the addition of mustard, or pepper. [Avoid all sweet, savoury, or fat food.] The drink should, likewise, be sparingly, but frequently taken, and ought to consist of lemonade; tart wines mixed with Seltzer water, and fermented with pounded sugar; or other liquors containing a large portion of fixed air.

Passengers at sea should wear flannel shirts and drawers, together with trowsers and other warm clothing; because these simple expedients have frequently prevented sickness, vomiting, and the numerous symptoms accompanying such convulsive efforts. They ought likewise to swallow, occasionally, a few drops of the spirit of vitriolic æther, commonly called the dulcified spirit of vitriol, either on lump sugar, or mixed with peppermint-water; and, if they be troubled with a slight diarrhœa, it will be proper to administer a few grains of rhubarb; or (which is preferable, if it can be effected) a clyster, consisting of Venice soap, dissolved in salt-water. Farther, they should, as long as possible, remain on deck, even during rainy and stormy weather; because the breeze arising from the sea, is far more salubrious than the confined and stagnant air of the cabin. No passengers, however, ought to watch the motion of the waves, particularly when the element is violently agitated by tempests; nor should they indulge in sloth or inactivity, but take proper and frequent exercise, such as working at the pump, &c. for indolence only tends to aggravate the disorder.... Lastly whatever may disturb or enervate the mind, such as reading, intense study, or meditation on gloomy subjects, must be purposely avoided, and no opportunity neglected, of participating in innocent mirth, and mental relaxation.

[In addition to the above directions, for the relief of the distressing sensation, the following directions may be attended to.

1. When nausea comes on, and cannot be subdued, the sufferer should place himself in an horizontal position, shut his eyes, and be perfectly still, and in the intervals of vomiting, take *small* draughts of sea-water, or in preference, an infusion of chamomile and ginger.

The editor has been told by a sufferer with this complaint, that *preserved ginger* occasionally taken, is highly refreshing. Dr. Ed. Miller advises opiates, with great propriety, and says, he was told that spiced wine is a common remedy on board of the packet boats, plying between the British ports and the adjacent continent.

A writer in the 7th volume of the Monthly Magazine (London,) says "the first and greatest preventive of sea-sickness, is, the acquiring the habit of being able to walk and stand upright without reeling to and fro; for it is, in my opinion, and I speak from experience in my own person, that the continual reeling motion of the body is the real cause of sea-sickness."

For an excellent paper on the subject of the sea-sickness, by Dr. Miller, the reader is referred to the *N. York Medical Repository*, vol. 4. p. 34."]

SEA-SLUDGE, or Salt-clod, is the surface, or that part of a saline marsh, which is deposited by the high tides. It is much richer, and less intermixed with sand, than the land which is more regularly overflowed.

Sea-sludge is an excellent *manure*; and though it be attainable only in a few situations, yet it deserves to be more generally employed. The best sludge is completely covered with grass: it is cut out of the marshes, to the depth of a spade, and, during the summer, is carted upon the land; on the surface of which it is spread, and suffered to remain in small clods, till it has become thoroughly mellowed by the winter frosts. It is then pulverized, by passing a harrow over the soil, after which it is ploughed-in with a thin furrow, for spring corn.

The proportion of this manure necessary for an acre, varies in different places, according to the nature of the ground; but, in general, it will be advisable to spread as much as will form a coat, or stratum, about an inch and a half or two inches in thickness. In some part of Lancashire and Cheshire, sea-sludge is occasionally employed as a substitute for marle, to which it is greatly superior, both on account of its ameliorating properties, and the longer duration of its effects; instances having occurred, in which land, manured with such mire to the depth of two inches, has retained its fertility *thirty* years.

SEA-WATER, denotes the salt-water of the ocean.

The salts which this fluid contains, are, 1. Common marine, or culinary salt, compounded of fossil alkali, or Soda, and marine acid; 2. Salited magnesia, or a saline substance formed by the combination of marine acid with magnesian earth; 3. A small portion of selenite, or gypsum....The quantity of saline matter obtained from the water of the British seas, is estimated by Newmann, to be

about one ounce in each pint..... See also the article SALT, p. 14.

Sea-water is of great utility for various purposes. It affords an excellent manure, either sprinkled on land, by means of the machine described in the article KITCHEN-GARDEN; or, when it is mixed with putrescible matters, formed into a compost, and distributed over the soil. In a medicinal view, Dr. RUSSEL *Dissertation concerning the Use of Sea-Water in Diseases of the Glands*, &c. 8vo.) states the following cases, in which this fluid may be drunk with advantage, namely, in all glandular obstructions, as well as in swellings of the neck, and other parts; in all cutaneous diseases; in recent obstructions of the liver and kidnies (provided the stone in the latter be not large); in bronchocele, or tumors in the wind-pipe; and, lastly, for the prevention of the bilious colics, to which mariners are frequently subject.

As many persons, afflicted with the complaints before mentioned, have not an opportunity of resorting to the sea-side, for the benefit of the water, different expedients have been devised, to preserve this fluid from putrefaction. For such purpose. Mr. HENRY made a variety of experiments, which are related in the first vol. of the "*Memoirs of the Literary and Philosophical Society of Manchester*:" ...the result of these, however, exceeding our limits, we shall merely observe that, from his first attempt, *two scruples* of quick-lime appear to be sufficient for preserving *one quart* of sea-water.

To purify the sea-water from its saline ingredients, so as to render it *fresh*, is an object of the greatest importance to navigators; for various accidents may happen, by which the stock of this necessary article on ship-board may be spilt, or become corrupted....In the year 1734, Mr. APPLEBY discovered a process, which for a short time was adopted in the Navy. It consisted in distilling sea-water with a certain quantity of *lapis infernalis* (which has since been discovered by Dr. BUTLER to be simply the rough *salt of tarter*), and calcined bones, or rather quick-lime; but such method was soon disused, on account of the difficulty with which it was attended, and the disagreeable taste it imparted to the water. Dr. B. therefore proposed, as a substitute for Mr. APPLEBY'S ingredients, the distillation of sea-water with soap leys, in the proportion of one quart of the latter to 15 of the former; which he asserts (in his *Safe, Easy, and Expeditious Method of procuring any quantity of Fresh Water at Sea*, &c. 8vo. 1755), will produce 12 gallons of fresh water; but the objections before stated have also been applied to this process....Dr. HALES recommended pulverized chalk; which, however, is said to be too expensive, and does not improve the taste of the saline fluid.

Sea-water may be easily divested of its salt taste, by distilling it with wood-ashes, particularly with those obtained from the beech-tree. The same desirable object may be effected, by filtering the fluid through sea-weed; and we conceive, that other marine vegetables might be employed with equal advantage. But the most simple apparatus is that invented by Dr. IRVING, for which he received a reward of 5000*l*. By this contrivance, all stills, still-heads, &c. are

rendered unnecessary ; because the common boiler or kettle belonging to a ship, will serve as an effectual substitute : with this ought to be connected, a plain tube made of plate-iron or sheet-tin, that may be easily procured on board. As soon as the sea-water is poured into such vessel, the tube must be fitted to the lid or cover, round which a piece of wet linen may be applied, to adapt it the better to the mouth of the new still. When the water boils, the vapour should be suffered to pass freely for a minute, in order to clear the tube, which is then to be constantly moistened, by passing a mop dipped in the sea along its upper surface. The distillation should be continued till three-fourths of the water be drawn off, when the brine ought to be taken out : thus, any quantity of pure water may be obtained, without the aid of any ingredients.... The utility of this expedient is obvious ; and we trust that it is, or at least will be, generally adopted on board of every ship that is bound to a distant port.

SEA-WEED. See MANURE.

SEA-WRACK, or *Fucus*, L. a genus of vegetables, comprehending 145 species, 85 of which grow on the British coasts : of these we shall state the following as the principal :

1. The *serratus*, or SERRATED SEA-WRACK, is perennial, growing to the height of about two feet, and varying from a green to a yellowish or olive colour....It is employed by the Dutch for covering or packing lobsters and crabs, that are to be conveyed to a considerable distance ; because it keeps them alive much longer than any other species of this plant ; nor does it easily ferment, or become putrid.

2. The *vesiculosus*, COMMON SEA-WRACK, or SEA-WAURE, is perennial, and grows to the height of one foot ; producing its fructified parts in the months of July and August....It is an excellent manure ; for being strongly impregnated with saline particles, these are gradually imparted to the ground on which the plant is spread, and thus fertilize it in a remarkable degree. Indeed, if land be properly dressed with this maritime vegetable, it is asserted, that its efficacy will continue unexhausted, for seven or eight years ; an advantage which dung does not possess, as it requires to be renewed every second or third year.

Besides its utility as a manure, the Sea-waure serves in Jura, Skye, and other Hebride islands, as a winter food for cattle, which regularly frequent the shores for it after the tide has ebbed. The inhabitants of these isles, also, dry their cheese without using any salt, by covering it with the ashes of this plant ; which abound with saline particles to such a degree, that they produce one half of their weight in fixed alkaline salts.

Farther, we are informed by LINNÆUS, that the inhabitants of Gothland boil the Common Sea-wrack together with a little coarse meal, by which they prepare a kind of *wash* for their hogs ; and that the poorer classes, in Scania, not only thatch their cottages with it, but also employ it as fuel. The most profitable use of this plant, however, is that of making *kelp*, or pot-ash, which affords employment to many industrious families. So lucrative and highly

esteemed is this plant, that the natives of the Western Isles have even rolled large masses of stone and rock into the sea; with a view to promote and extend its growth.

With respect to its medicinal properties, also, the Sea-waure deserves particular notice...Dr. Russel (in his work quoted in the last article) recommends the saponaceous liquor found in the vesicles or bladders, that abound beneath the leaves of this plant, as a powerful resolvent in dispersing scrophulous and scorbutic tumors of the glands. He directs the patient to rub such swellings with these bladders, having previously bruised them in his hand, till the part be thoroughly penetrated with the mucus; after which they are to be washed with sea-water. Another method of employing the common sea-wrack, is by infusing 2lbs. of the vesicles above mentioned (which ought to be gathered in July, when they abound with viscid juice) in a glass vessel containing one quart of sea-water, for the space of fifteen days; at the expiration of which, the liquor will acquire the consistence of honey. It is next to be strained through a linen cloth; the tumors must be daily rubbed, and then cleansed in the manner already directed. By this treatment, he observes, not only scorbutic and scrophulous indurations, but even scirrhous swellings in the breasts of females, have been successfully discussed. Lastly, by calcining this vegetable in the open air, Dr. Russel obtained a very black saline powder, by him called *vegetable æthiops*; and which has been highly extolled both as a resolvent, and also as a dentrifice, for correcting the scorbutic laxity of the gums, and removing all foul matters from the teeth.

3. The *palmatus* (*Ulva palmata* of Dr. Withering), Palmated Sea-wrack, Dills, Dulls, Dullesh, or Dulse, abounds on the coasts of Scotland, on those of the contiguous islands, and on the shores of Northumberland. Its substance is membranous, pellucid, and thin; of a greenish or reddish colour: its height varies from five to six, and sometimes to twelve inches....This species, after being soaked in fresh water, is eaten either boiled or dried; in which latter state, it acquires a flavour, somewhat resembling that of violets; and according to Bechstein, the sweetness of *sugar*: yet, unless it be dried in close vessels, no saccharine but *saline* particles will appear on its surface; because the former are dissipated in the open air; a remark for which we are indebted to Olaffen, the Icelandic traveller....The dulse is sold in a dry state, in the streets of Dublin; and Dr. Rutty observes, that it is supposed to sweeten the breath, and to destroy worms....In the Isle of Skye, this plant is occasionally boiled in water, with a little butter, and administered in fevers, with a view to promote perspiration; though in this form, it is often attended with purgative effects.

4. The *ciliatus* (*laciniatus* of Dr. Withering), or Fringed Sea-wrack, abounds on rocks and stones, on the British coast; where it grows from four to five inches high; consists of a membranous, pellucid substance; and is of a red colour. It is eaten both in Britain and Ireland, like the preceding species.

5. The *pinnatifidus*, INDENTED, or JAGGED SEA-WRACK, or PEPPER-DILSE, is also met with abundantly on the rocks of Britain, which are covered with the tides. It attains two or three inches in height; and is of a yellowish-olive colour, frequently tinged with a reddish hue. It is likewise eaten both in Scotland and Ireland.

6. The *esculentus*, ESCULENT SEA-WRECK, BLADDER-LOCKS, or TANGLE, is common on the rocks contiguous to the shores of Cumberland and Scotland; where it grows from five to ten yards in length, and one foot wide, being of an olive or green colour. This species furnishes a grateful food for cattle; and its stalk, when boiled, affords a culinary dish in Scotland, as well as in some parts of England: the proper season for gathering this vegetable is the month of September, in which it is found in the greatest perfection. The Esculent Sea-wrack has, farther, been recommended for restoring the natural appetite in the disorder, termed *pica*, or *longing*.

7. The *saccharinus*, SWEET SEA-WRACK, or SEA BELT, abounds on the sea-shores. Its stem is from 2 to 12 inches in height, of an oval form, a leathery consistence, and of a tawney-green colour. If it be washed in the spring, and suspended to dry, a sweet saccharine matter will exude from its extremeties; though not in such quantity as from the Palmated Sea-wrack. The Sea-belt is eaten, both when taken fresh out of the sea, and also boiled as a pot-herb.

SEALING-WAX, is a composition of gum-lac, melted and incorporated with resins, and afterwards coloured with some pigment, such as vermillion, verditer, ivory-black, &c.

There are two kinds of Sealing-wax, generally used; the one is *hard*, for the sealing of letters, and similar purposes; the other *soft*, for receiving the impressions of seals of office to charters, patents, and other written documents.

In order to prepare the best hard *red sealing-wax*, take two parts of shell-lac, with one of resin, and one of vermillion; let these ingredients be reduced to a fine powder; melt them over a moderate fire; and, when they are thoroughly incorporated, form the composition into *sticks*. Seed-lac may be substituted for the shell-lac, and instead of resin, boiled Venice turpentine may be employed. A coarser kind of such sealing wax may be manufactured by mixing equal parts of resin, and of shell-lac (or vermillion and red-lead, in the proportion of one part of the former, to two of the latter); then proceeding in the manner above directed. But, where large quantities of this wax are consumed, both the vermillion and shell-lac are generally omitted, so that it may be obtained at a much cheaper rate.

Black sealing-wax is composed of gum-lac, or shell-lac, melted with one-half or one-third of its weight of levigated ivory-black.... To prevent the composition from becoming too brittle, Venice turpentine, in the proportion of two-thirds of the above ingredients, is usually added; as it likewise contributes to improve the beauty of the manufacture. These substances being melted, and properly stirred over a slow fire, the liquid is next poured upon an iron plate, or stone, previously oiled; and,

while soft, it must be rolled into sticks; which are then exposed to heat, till they acquire a glossy surface.

Uncoloured soft sealing-wax is commonly prepared of bees-wax, 1 lb.; of turpentine, 3 oz.; and of olive oil, 1 oz.: these ingredients are carefully boiled in a proper vessel for some time; till the compound become fit to be formed into rolls, or cakes, for use. And, in order to impart to it the requisite colour, one ounce or more of either of the pigments above mentioned may be added, stirring the mass till the whole be duly combined.

SEAVES. See RUSH the Common.

SEED is the embryo contained in the fruit of vegetables; or, according to LINNÆUS, a deciduous part of a plant, comprising the rudiments of a new terraqueous production.

As all the various vegetables, fruits, &c. used in rural and domestic economy, are raised from *seeds*, the most eminent naturalists have bestowed particular attention on the subject of *selecting*, *preserving*, and *sowing* them. We shall therefore concisely state the result of the most successful experiments, under these respective heads.

I. The SELECTION of seeds depends principally on a proper choice of grains and kernels, as well as roots from the most vigorous vegetables, growing under our own inspection: for, though it be conjectured, that the constant cultivation of a particular plant from the same seed, and on the same soil, will at length cause it to degenerate, yet numerous well-attested instances have occurred, in which the contrary effects have been evident. The most healthy stalks or stems should, therefore, be selected for bearing seeds; and such as attain to maturity at the earliest period in the season, ought to be preferred, especially if they grow at a distance from weakly plants of the same species; lest the fecundating farina of the latter be blown upon the stigmata of the former, and an inferior kind, or succession, be produced.

The proper time for gathering seeds, is the period of their perfect maturity, which may be ascertained by the dryness of the stem; because, when the latter begins to decay, it becomes "bleached by the oxygen of the atmosphere," and no farther nourishment can then be conveyed to the ripe seed. The harvest should now be commenced without delay; and numerous hands be employed in threshing and housing it, lest any shower should fall, and thus a considerable portion be scattered on the ground.

II. Various expedients have been devised, for the PRESERVATION of seeds: the most simple consists in secluding them from light and heat in the bowels of the earth; where they will retain their vegetative power for several years. Thus, Dr. DARWIN mentions instances of mustard-seed producing a crop, on digging up soil, where it had remained in a state of rest for many years, and, "as was believed, *even for ages*." In the same manner, the best cucumbers and melons are raised from seeds, which are at least three or four years old; though some gardeners do not employ them, till they have been kept ten or twelve years.

Where seeds of a perishable nature are to be carried to, or brought from, distant places, it has been

found useful to cover them with a thin coating of a mixture of pitch, resin, and bees-wax; which composition is termed *mummy*. Acorns and other seeds, thus managed, have appeared on importation, as fresh as if they had been newly gathered. Dr. DARWIN conjectures, that they might be safely preserved by covering them with soft sugar; and his supposition has been confirmed by the experiment of Mr. SNEDYE (recorded in the 16th volume of the "*Transactions of the Society for the Encouragement of Arts*," &c.), who observed, that such as were packed in sugar, or among raisins, not only appeared healthy, but grew readily, while many others would not vegetate. Lastly, Dr. D. farther thinks it probable that, if seeds were surrounded with newly burnt charcoal, or which has not been long exposed to the air, and then reduced to powder, they might be successfully kept in a fresh state, either during long voyages, or in domestic granaries.

III. The proper time for SOWING seeds, entirely depends on the nature of the plants to be raised: and as we state such seasons, when treating of the respective vegetables, in the order of the alphabet, we shall here only mention the opinion of Dr. DARWIN, that the most advantageous method of disseminating native plants, is by suffering them to drop on the surface of the soil, as they fall from the parent stock; being covered only by their deciduous leaves. But, when these germs of vegetation are imported from distant climates, such as will ripen in the same year, ought to be sown at an early period in the spring, and slightly covered with mould, in order to shelter them from birds and insects. Others, on the contrary, which do not completely germinate in one year, should be committed to the ground in the beginning of autumn, at the depth of an inch and a half; both for protecting them from the frost, and from the depredations of birds. As these precautions, however, are not always a certain preservative, practical gardeners have recommended the steeping of valuable seeds in a strong solution of the liver of sulphur, for three or four hours, or such time as will be sufficient to penetrate the skin, or husk: by this simple expedient, all vermin will be effectually prevented from devouring the seed.

SEG, or *Carex*, L. a genus of perennial plants, comprehending 117 species, 45 of which are indigenous: the most remarkable of these are:

1. The *arenaria*, or SEA SEG, which commonly thrives in the loose and moveable sands on the shores, and flowers in the month of June. Its creeping roots contain a large proportion of farinaceous particles; from which, in times of scarcity, wholesome bread has been prepared: early in the spring, they are said to possess medicinal properties, not inferior to those of the SARSAPARILLA.

2. The *vulpina*, or GREAT SEG, abounds in marshes, and on the banks of rivers: it flowers in May or June. Although this is a pernicious weed in meadows, yet the whole herb may be usefully employed as a substitute for straw, in packing goods liable to be injured by carriage; for drying up swamps or morasses; for the erection of dams; and the sward for fuel, in-

stead of peat: its seeds are likewise of service in feeding aquatic birds.

3. The *acuta*, or SLENDER-SPIKED SEG, grows at the sides of rivers, ponds, and ditches, as likewise in meadows; it flowers towards the end of April or May. This species is divided into two varieties, namely, the *nigra*, or BLACK SEG, and the *rubra*, or RED SEG, from the respective colours of their flowers. Both are very noxious weeds; as they not only stifle the growth of other grasses, but also afford food to insects, which are detrimental to the health of cattle. The only economical purpose to which the Slender-spiked Seg may be rendered subservient, is that of being mixed, and cut, together with straw for feeding horses in the winter.

SEGGRAM. See RAGWORT, the Common.

SELF-HEAL, the COMMON, or *Prunella vulgaris*, L. a native perennial plant, growing in meadows and pastures; bearing purplish flowers in the month of August.... It possesses an austere taste; and, though exploded from the list of *healing* plants, it may be eaten as salad, while young, and also boiled like spinach. Cattle, in general, relish this herb; and bees collect honey from its flowers.

SEMOLINA, a nutritious preparation, consisting of granulated wheat.

In 1780, a patent was granted to Mr. JACOB LEVY, for a method of making *Semolina*, which hitherto was imported from Poland, where it is called *Cracow-Groats*. It consists in grinding wheat, in an appropriate mill; after which the flour is separated from the *middlings*: the latter are then dressed four different times in a bolting-mill, and sifted through parchment seives, till they are perfectly cleared from all bran and pollard.

Semolina forms a wholesome and light food for invalids and convalescents, being preferable to sago; as it perfectly dissolves in water, while the foreign drug undergoes only a partial solution: thus, considerable sums might be saved to the nation, which at present are annually paid for the importation of SAGO.

SENEGA, a gum obtained from the *Mimosa nilotica*, L. and which greatly resembles that of arabic; possesses similar properties, while it is much cheaper; and is imported from Senegal, and the coast of Guinea, in loose or single drops, generally of the size of an egg: their surface appears wrinkled, and less bright than the inner substance. It is destitute of smell, and has little or no taste.

Large quantities of Gum Senega are annually consumed by dyers and artificers; but this drug is now seldom used as a medicine.... In Africa, it constitutes a principal ingredient in native dishes, being previously dissolved in milk; though the solution, taken alone, is likewise a favourite repast of the negroes.

SENNA, or *Cassia senna*, L. an exotic shrub cultivated in Persia, Syria, and Arabia, whence its dried leaves are imported. They are of a yellowish-green colour, have a faint, though not unpleasant smell; and a sub-acrid, bitterish, nauseous taste. There is a spurious sort of this drug obtained from Tripoli, and other places; but the fraud may be easily detected; as the latter is of a fresh green colour, without any yellow shade.

Senna is an useful purgative, operating mildly, though effectually; and at the same time promoting the secretion of urine. Its ill flavour may be corrected, by slightly boiling the leaves in water; and, being apt to occasion gripings, it should be conjoined with any proper aromatic tincture, or distilled water; dried lemon or orange peel; fennel or aniseeds:....to increase its effects on the bowels, manna, rhubarb, tamarinds, figs, or prunes, are generally added. In a state of powder, the dose of senna is from a scruple to a dram; but, when taken in decoction, from one to three or four drams are required.

SEPTFOIL. See TORMENTIL, the Common.

SERPENT, an appellation given to an order of reptiles comprising among other kinds, the VIPER and SNAKE.

Consistently with our plan, we cannot enter into any disquisition respecting the real or supposed fascinating powers of the reptile race; we shall therefore state the remedies to be employed, in case a person should be unfortunately *stung*, or bitten. Such disaster is indicated by acute pain in the wound, accompanied with swelling, which is at first red, though it afterwards assumes a livid hue, and extends to the contiguous parts; by uncommon faintness; a quick, low, and interrupted pulse; great nausea, attended with convulsive and bilious vomitings; cold sweats, and sometimes by pains in the region of the navel. A sanious liquor, in most instances, exudes from the spot affected, round which arise small pustules: the patient's skin acquires, in the course of an hour, a yellow colour, resembling that usually observed in the jaundice. These are the symptoms generally occurring in Europe; but, in hot climates, and if the venomous creature be of a large size, the distressing scene is often closed by death.

Numerous remedies have been recommended for the cure of wounds inflicted by serpents. Dr. MEAD advises the poisonous matter to be extracted by means of a cupping-glass, or (which is preferable, if it can be effected) by the mouth; in which the persons sucking the parts should hold a little warm olive oil, to prevent the lips and tongue from being inflamed; though he observes, that the suction ought on no account to be deferred for want of oil; as a delay of a few minutes might be productive of the most fatal consequence. Where this operation, however, cannot be performed, Dr. M. proposes the application of a red-hot iron, or of alkaline salts to the wound; because, if the venomous matter be not absorbed and conveyed into circulation, these cauteries will destroy or change its nature. Lastly, in order to counteract the effects of such portion of the virus as may have been received into the system, he directs an emetic of ipecacuanha immediately to be taken; the operation of which must be assisted by the liberal use of oil and warm water..... The patient should now be placed in a warm bed, and a profuse sweat be promoted by means of cordials, which will carry of the remaining or latent effects of the poison.

The Abbe FONTANA proposed a *ligature* to be expeditiously applied: such bandage, indeed, if properly tied between the wounded part and the heart, will doubtless

prevent the poison from operating fatally; but, as it is calculated to produce *gangrene*, we conceive excision by the knife is in all respects preferable.

Beside these preventive and curative measures, the use of the volatile ammonia has been attended with uncommon success, both in Europe and India: [See articles ALKALI, AMMONIA] though FONTANA found it less effectual in his experiments on the poison of the viper. Dr. WRIGHT, therefore, directs 40 drops of the caustic volatile alkali, or of EAU-DE-LUCE, to be taken in any liquid, as soon as possible after the accident; the dose being repeated every five minutes, while the parts are continually washed with the same preparation. Farther, calcined hartshorn, and oil of olives, externally applied, have produced beneficial effects; as also has a liniment, consisting of vinegar and butter, both when taken by the mouth, and rubbed on the wounded part.

[In the United States, numerous vegetable remedies have been celebrated at various times, as cures for the bite of the rattle-snake, all of which the reader will find enumerated in a *Memoir* on this subject, by Dr. BARTON, in the 3d vol. of the *Trans. of the Amer. Phil. Soc.*...See also AYA PANA. In the 4th vol. of the transactions of the same Society, may be found another by the same author, on the *fascinating power of serpents*, the possession of which wonderful power is fully disproved.

Dr. JOHN BRICKELL of Savannah, having lately found that "litmus paper was reddened by water, into which he had previously put the teeth and appendages of a large rattle-snake, was induced to try the virtues of alkalies in the cure of the effects of the bites of venomous snakes; and within the course of the last summer, experienced the most decided benefit from the use of the remedy in the case of a negro who was bitten by a *mokasin snake* in the foot, while cutting rice. Sweet-oil, broad leaved plantane, hoarhound, *frenanthes alba*, *(autumnalis)* were all given without effect, and the pain and swelling were making rapid progress up the limb to the body. Dr. B. ordered one or two tea spoonsful of an alkaline solution every 15 minutes, and the bitten part to be kept moist with the solution. The first dose produced an immediate good effect; the stomach of the man "felt on fire," and he was indulged in his request to have it oftener than had been prescribed, and seemed to wonder what had worked such a miracle, (as it was termed), as to stop the progress of the swelling and pain, and remove both from the stomach and bowels in so short a time. The glands of the groin were swelled, and felt like a bag of hickory-nuts, and the thigh, leg, and foot, were still greatly swelled and in excessive pain. The use of the tartar was continued externally and internally, and the swelled thigh and inguinal glands were moistened and gently rubbed with the alkaline solution, and when it was expended, he made use of some ley of wood ashes. The bitten part was washed with water, in which a fresh burnt oyster-shell was infused for want of a caustic alkali. The medicines were continued all night, and in the morning, the swelling and pain had en

tirely left the glands of the groin, and was much diminished in the thigh, foot, and leg. The pain continued in the bitten part sometime after, owing as Dr. B. suspected, to one of the snake's teeth being lodged in the wound, as on examining the animal, he found only one large tooth in its upper jaw, and he believes the teeth are naturally in pairs; an incision was therefore ordered to be made on the top, and under part of the foot, and also a large poultice on it to facilitate the exit of the tooth.

The above account was transmitted to the editor by Dr. B. and affords sufficient grounds for a repetition of the same mode of treatment. Should it however be found to fail, the treatment may be pursued which has been recommended to prevent the effects of the bite of a mad animal, see vol. i. p. 285..... Symptoms of a locked jaw, have sometimes followed the bite of a rattle-snake, for the relief of which, bleeding has been succesfully prescribed.]

SERRADILLA, or COMMON BIRD'S-FOOT (see vol. i. p. 281), a valuable plant, which thrives much better than saintfoin, or any other grass, on poor sandy soils: it is propagated by drilling the seed in rows, two feet asunder; but may be transplanted in the same manner as cabbages. This vegetable affords a grateful food to cattle of every description: it has not, indeed, been hitherto extensively cultivated, excepting by LANGFORD MILLINGTON, Esq. at Rushford, Norfolk; whose spirited experiments are recorded in the 27th vol. of *Annals of Agriculture*; but, as it promises to be productive of the greatest benefit to agriculturists, on the poorest lands, we trust that it will in future be generally introduced into such a situation.

SERVICE-TREE, or *Sorbus*, L. a genus of native trees, consisting of three species, namely:

1. The *aucuparia*. See QUICKEN-TREE.

2. The *domestica*, (*Pyrus domestica* of Dr. SMITH) or TRUE SERVICE-TREE, grows in mountainous forests, principally in Cornwall, Staffordshire, and in the county of Worcester. It flowers in the month of April or May. The fruit of this species being mealy and austere, like that of the Medlar, is a powerful astringent, and of considerable service in alvine fluxes, especially in dysenteries: hence we learn from BECHSTEIN, that the soldiers in the Prussian army, who were attacked with that epidemic in 1792, and to whom the *rob*, or even the berries, were given in sufficient quantities, uniformly recovered, while others died of the disorder. Nor is this fruit less useful for making cyder, and distilling brandy. Its wood is remarkably hard, and therefore valuable to turners for screws or cog-wheels; and to mathematical instrument-makers, for rulers, gauging-sticks, &c.

3. The *hybrida* (*Pyrus hybrida* of Dr. SMITH), BASTARD MOUNTAIN ASH, or BASTARD SERVICE, is found principally on mountains, where it flowers in the month of May. This tree forms a singular variety of the two preceding species, and consequently partakes of their united properties. Its wood, however, is softer than that of the true Service-tree; and, though affording good fuel, its charcoal is greatly inferior to that obtained from the latter:....its berries are sweeter, and preferably eaten by birds.

The Service-tree is cultivated in Britain, principally as an ornament for diversifying extensive plantations; as it grows to the height of 40 feet. It is propagated by sowing the seed, a short time after the fruit is ripe, in pots, which must be sheltered during the winter; and when the spring advances, it will be proper to plunge them in hot-beds, and to water them frequently, during dry weather. Towards the middle of October, the young plants may be removed to a warm spot of light soil, and placed one foot apart from each other, in rows two feet asunder. Here they should remain for three or four years; at the expiration of which, they ought to be transplanted to the place appropriated to their growth.

SERVICE-TREE, the Wild. See HAWTHORN.

SERUM. See BLOOD.

SETTER-WORT. See HELLEBORE, the Fetid.

SETON, in surgery, a kind of issue, or artificial ulcer, produced by passing the *seton-needle* through any of the larger muscles, and introducing a *cord* made of cotton or silk thread; in order to effect the discharge of superfluous, or morbid, matter.

Instead of describing the particulars, relative to this chirurgical operation, we shall merely observe, that setons occasionally prove useful remedies; especially where the body abounds with humours:..... hence they are frequently made in the back of the neck, for diseases of the eyes; or between two of the ribs, in affections of the chest..... As, however, a seton occasions a great degree of pain and irritation, it is not applicable to weakly and delicate persons, with whom the common issues generally agree. Nevertheless, either of these remedies are attended with similar effects; and the former, in particular, has been strongly recommended in ulcerations of the lungs and chest; nay, the late Mr. POTT was the first who successfully employed this expedient in various cases of *hydrocele*.

SETONS, in *farriery*, are occasionally applied to various parts of a horse's body, for the purpose of discharging matter from deep seated tumors or abscesses.

Setons are introduced by means of long, thin needles, dart-shaped at the point, and armed with a suitable cord. The size of the instrument, as well as the thread, depends on that of the part affected....When matter is perceived to fluctuate in the tumor, the seton-needle, armed with a proper cord, is to be introduced at the upper part of the abscess; and the point conducted through it so as to be brought out in an opposite direction. In some instances, it will be advisable to perforate the sound muscular flesh, and thus to form a depending orifice, for the more easy discharge of the matter: in either case the cord should be previously dipped in some digestive ointment, and secured at both ends with a thread. Instead, however, of tying the cord together, some farriers preferably apply a small button of wood, or similar substance, to each end. Thus, when shifted, the thread may be drawn upwards and downwards; though, if its ends be conjoined, it forms a circle, and may always be removed towards the lower orifice. When the matter in the abscess appears to be wholly discharged the cord may then be drawn out, and the

wound be allowed to close. But, where the additional sore, thus occasioned, shews no disposition spontaneously to heal, it must be treated like a common ULCER.

SHADDOCK. See ORANGE.

SHAGREEN, or CHAGREEN, is a kind of rough leather, prepared from the skin of the spotted SHARK.

For this purpose, the skin of the fish is first stripped, then extended on a table, and covered with bruised mustard-seed; it is thus exposed to the weather, for several days, and afterwards tanned.

The best shagreen is imported from Constantinople. It is of a brownish cast, and very hard; but, when immersed in water, it becomes soft, and pliable; and may be dyed of any colour.

Shagreen is often counterfeited, by preparing morocco leather in the same manner as the skin of the fish above mentioned: such fraud may, however, be easily detected by the surface of the spurious manufacture peeling or scaling off, while that of the genuine article remains perfectly sound...Shagreen is employed principally in the manufacture of cases for mathematical instruments, watches, &c. tho' it is sometimes used for covering books.

SHALE is a black, slaty substance, or a species of clay concreted into a stony consistence, and impregnated with a considerable quantity of bituminous matter. It is of various degrees of hardness, but does not emit sparks when stricken against steel; and, on being heated, it exhales a strong smell.

Large strata of this mineral are dug out in Derbyshire, as well as in those counties which contain fossil coal. On calcination, an acid is evolved, that combines with the argillaceous particles, and forms ALUM. The shale is next immersed in water, in consequence of which, the alum thus obtained is dissolved; and, after undergoing various processes, is formed into the masses usually met with in the shops....It is computed by Doctor WATSON (*Chemical Essays*, vol. ii.) that 120 tons of the calcined shale will produce one ton of alum.

SHALLOT. See ESCHALLOT.

SHARK, or *Squalus*, L. a genus of fish, comprehending 32 species, of which the following are the most remarkable:

1. The *Canicula*, Spotted Shark, or Dog-fish, inhabits almost every sea, and grows to the length of 4 feet: it attains a considerable age, is extremely voracious, and chiefly subsists on fishes. The skin of this species is beautifully spotted, like that of a leopard; when stripped off, it is manufactured into SHAGREEN, and is likewise employed in a dry state, for polishing wood, and for other purposes.

2. The *maximus*, Basking Shark, or Sun-fish, abounds in the Irish Channel, and on the Western Coast of Scotland. It is of a prodigious size, measuring sometimes 27 feet and upwards in length: it has been observed to derive great pleasure from basking on the surface of the ocean, during the heat of the day. Its liver is valuable, on account of the great quantity of oil which it contains: those of the larger kind yielding, upon an average, 8 barrels each. The catching of the basking shark, and melting down its liver, afford employment to many industrious families: ....the oil thus procured, is not only pure, sweet, and fit for lamps, but is also much used externally for

relieving bruises, burns, and rheumatic pains.

3. The *Carcharias*, Great White Shark, or Requin, is the most formidable and destructive enemy of the mariner. It sometimes infests the British seas, but generally those of hot climates, where it grows to the length of 30 feet, and weighs from 3 to 4000 lb. According to FUNKE, however, its weight occasionally amounts to 10,000 lbs. and the fish measures ten feet in circumference. An entire horse has been found in the stomach of this monster. And as it is probable, from the large teeth (*glossopetræ*) sometimes dug out of the earth, that the requin, in former ages, must have been a still more bulky creature, naturalists have conjectured that such a fish, and not a whale, swallowed Jonah. The Great White Shark is particularly dangerous to swimmers, who have often lost one or more of their limbs, and not unfrequently been devoured entire. This fish is principally valued for its oil; as its flesh, though eaten in Norway and Iceland, is extremely rank and coarse.

SHAVE-GRASS. See HORSE-TAIL, the Rough.

SHAVING is the act of removing the hair from the beard, by means of a razor.

This operation greatly contributes to cleanliness; and though, from peculiar circumstances, a person be prevented from performing it regularly, yet the chin ought to be shaved every second day, or at least twice in the week, both to avoid the slovenly appearance, and the uncomfortable sensation, which such neglect necessarily occasions. For this purpose, the face ought to be previously washed with tepid water, and a thick lather laid on, with a proper brush. The part of the skin, from which the hair is to be cleared, should then be gently stretched with the fingers of the left hand, while the razor is applied in a *flat* position, and with a considerable degree of pressure *forwards*: being at the same time drawn obliquely *downwards*.

After the operation, the face ought to be washed with *cold* water, and the instrument wiped perfectly dry, either on a cloth or soft leather. For the proper management of RAZORS, *previously* to shaving, the reader will consult that article in its alphabetical series.

[A very curious and useful paper on the art of shaving, by Mr. NICHOLSON, may be found in the first vol. of the *Phil. Journal*, 8vo. edited by that author.]

SHEEP, or *Ovis*, a genus of quadrupeds consisting, according to LINNÆUS, of *three* species; though later naturalists admit only *one*, and consider the others as varieties. The principal is the *aries*, or common ram and ewe. Their bodies are covered with long, whitish, slender interwoven hair, which is termed *wool*; and, when shorn, the *fleece*:...they have eight fore-teeth in the lower jaw; and the heads of the males or rams, are furnished with concave horns, remarkably wrinkled and curved.

In a wild state, the sheep is lively, robust, and able to support fatigue; but, when domesticated; and fed in pastures, it becomes timid, and resorts in the hour of danger to the shepherd and his dog, for protection.

Ewes generally breed at the age of 18 months; though the most experienced breeders never suffer them to increase their species, till they are at least two years old;

and, as these animals are of considerable value, great attention is bestowed on their management at this period.

The first object therefore is, whether the breeder has sufficient grass to maintain the ewes and their lambs in the spring; or, whether he has a stock of turnips adequate to their support, till the pasture affords them food. The next consideration is the *choice* of ewes, in which case the same characteristic marks should be observed, as have already been stated under the article RAM :.....another circumstance of great importance, is that of attending to the *breed*; because no certain degree of excellency can be attained in any species of cattle, unless the female possess an equal degree of *blood* with the male.

Ewes bring forth one, two, and sometimes three lambs, after a gestation of twenty weeks; so that the most advantageous period may, in general, be easily ascertained. The best time of yeaning is the month of April; unless the owner have very forward turnips or grass, or the animals be *field-sheep*.... After the lambs are dropped, they must be managed in the manner already stated in vol. iii. p. 429. ....If, however, the males are designed for wethers, the necessary operation should be performed early, except when they are unusually weak; in which case it will be advisable to defer it, till they acquire sufficient strength: on weaning the lambs, their dams may be milked two or three times, in order to relieve their udders.

The most proper time for *shearing* sheep, is towards the middle of May, or at the farthest, about Midsummer; though some breeders defer it till the middle of July: because they suppose that an additional half-pound weight in every fleece may be obtained, by the increased perspiration of the animal. An early shearing, however, is preferable; for the new wool will thus not only gain time to *get a-head*, but the animals are also secured from the attacks of the fly; whereas, by delaying the operation, they become a more easy prey to the maggot; in consequence of which, they pine away, and lose all their flesh. But, previously to shearing, the sheep ought to be washed, and kept for a few days in a clean *rick-yard*, or in a dry pasture, whence they should be taken out separately; after they are shorn, it has been recommended to wash them with sea-water; or, where this cannot be procured, with a brine made of common salt and soft water; as such practice is calculated to prevent the various diseases, incident to these useful creatures.

Farther, it is usual to mark sheep when divested of their wool, with some colouring matter; in order to distinguish those belonging to different proprietors. The fossil known under the name of *reddle*, or *ruddle*, is generally employed for this purpose. Dr. LEWIS, with the same intention, directs finely levigated charcoal (or preferably *lamp-black*), to be mixed with tallow, over a moderate fire, in a proportion sufficient to produce a deep black colour, and a proper consistence. To render this compound more durable, he observes, that one-fourth, sixth, or eighth part of *tar* may be melted together with the tallow; the whole of

which, however, will be readily discharged from the wool, by washing it in soap-water....We understand, that Sir JOSEPH BANKS has, likewise, contrived a compound metal, from which the wool receives no damage.

With respect to the feeding and fattening of sheep, the most useful grasses and other vegetables have already been stated in the articles CATTLE, GRASS, MEADOW, &c.: hence our attention will now be directed to the nourishment derived from turnips, which experience has evinced to be one of the most lucrative methods. Some farmers turn the sheep into a field promiscuously, suffering them to eat the roots at pleasure; but this practice is by no means economical. Others divide the land by hurdles, and inclose the animals in such a space as they are able to clear in one day; advancing progressively till all the turnips are consumed. Another mode consists in digging or pulling up a sufficient quantity of turnips, and then admitting the sheep into the inclosure. The most advantageous expedient, therefore, is that of exposing these roots on the surface of the soil, and removing the sheep to a fresh place every day; and if a small quantity of pease (not exceeding two or three bushels per *diem* for 150 wethers) be allowed, the animals will eat both the turnips and their leaves, from which they will obtain additional nutriment, and grow uncommonly fat. Farther, this management will be attended with beneficial effects on the soil; so that a piece of land, contiguous to the turnip-field, may be manured without the expence of conveying dung by carriage. And, as the ground on which turnips are generally cultivated, is too moist for sheep in autumn or winter, it would not only be *poached* by the opposite old method, but the roots would also be trodden in; and, from their great moisture, the animals become liable to be seized with the rot.

Sheep are subject to various diseases, in common with other cattle, such as that of being *hoven* (see vol. 2. p. 50), &c.; but there are several disorders peculiar to the former; and which, it will be useful to state, together with the most approved remedies: namely,

1. The FLY-STRUCK, which see.

2. The *Rubs* or *Rubbers*, may be known by the restlessness of the animals, which rub themselves in every attitude; their skins being perfectly clean, without any trace or scab: when dead, their flesh assumes a greenish cast, but does not possess a bad taste. Sheep fed in fine meadows are more liable to be thus affected, than such as are pastured on poor soils: the disease generally terminates at the end of three or four months. No cause has yet been assigned for the *Rubs*; the malady having hitherto appeared chiefly in the county of Norfolk. Mr. YOUNG, however, informs us, that it originates from a whitish-yellow worm which settles in the brain; being about an inch and a half in length, and of the thickness of a common goose-quill. He observes, that, at present, there is no prospect of cure; but, if the generation of this insect could be discovered, the disorder may possibly be prevented.

3. The ROT; and,

4. The SCAB; to which we refer.

[In some cases of Rot, *camphor*, has effected a cure. The dose may be a piece the size of a nutmeg, twice a day or oftener.]

5. Red-water; see which: Lame, p. 429.

6. The *Dunt* is occasioned by a vesicular collection of water in the head; and for which no cure has hitherto been devised.

7. The *Fly* or *Maggot*, is an insect that breeds in the skin of sheep. If the animal be attacked before shearing, it becomes sickly and indisposed; its wool, not yielding a sufficient quantity of *yolk*, affords a warm nest for the reception of the eggs, which are speedily hatched. The maggots immediately feed on the flesh of the sheep; and, if they be not timely destroyed by the application of tar, the vermin will multiply so rapidly, as to destroy the animal in a short time.

8. *Giddiness* is conjectured to proceed from a worm, which insinuates itself under the horns, and causes the sheep to stagger, or reel: it may be cured by perforating those parts. Such distemper is also said to be induced by weakness, in consequence of poor *keep*: hence, relief may be afforded by removing the animal to better pasture, and allowing it a sufficiency of dry nourishing food.

9. The *Hunger-rot* generally arises from poverty of winter provender, and may be ascertained by the leanness of the animals. The proper cure is an immediate change of fodder.

10. The *Tick* is a small, flat, brownish insect, that infest sheep; and, if it be not speedily destroyed, is very detrimental both to the flesh and wool: it has six legs, and a flat proboscis with three notches on each side; by means of which it insinuates itself into the *pelt* or skin. Soon after the insect has thus settled, its legs drop off, and a scab is formed on the surface; from which a small portion of ichorous matter is discharged. The scabby crust increases with the growth of the tick; which, when arrived at its full size, nearly resembles that of a middling horse-bean; and other insects are generated, to the great injury of the flock. In order to remove these troublesome vermin, it has been recommended to mix an ounce of corrosive sublimate, a quarter of a pound of bay-salt, and one ounce of cream of tartar (the last two articles being previously pulverized and sifted), with two quarts of soft water. The wool must be separated, and the diseased spots washed with this liniment two or three times, or oftener, if it be found necessary; till the insects be effectually destroyed.

[The Rev. Dr. Peters of London, who formerly resided in the United States, patriotically published the following remedy, for ticks, in the news-papers, last year, for the benefit of the American farmer. The remedy is to be applied in October.

"*The mode of making the unction to destroy ticks on Sheep, viz.*...Take one gallon of tar, put it into an iron kettle, over a slow fire, until rendered liquid; then having eight pounds of salt butter melted in another kettle, pour it gently into the tar-kettle, stirring them well together, leaving the salt of the butter at the bottom, then increase the fire, and make the tar and butter boil together, stiring them all the time; after boiling, pour it into any dish to cool. The

next morning the unction will be of a proper thickness, and fit for use.

The next day after washing the sheep, they are sheared, and no ticks will appear until the wool becomes long in October, and incommoded by summer damps and ill health which are removed by a new salving.

To salve a sheep; the shepherd parts the wool with his fingers on the backbone from the head to the end of the tail, then with two fingers rubs the unction plentifully on the skin or flesh; so that the ointment may spread by heat of the body, two or three inches down each side from the ridge bone.

The shepherd then parts the wool as before, two or three inches from the ridge-bone, and rubs the unction as before in such abundance, as it will spread two or three inches downwards, then continues the same method all around the sheep. The shepherd will salve a score of sheep in one day; and the unction will kill and destroy all ticks, cure and prevent the scab, soften and supple the skin, promote the growth and increase the quantity of wool. The sheep being freed of ticks will be quiet, comfortable and healthy, whether fat or lean, and whether with a large fleece on, or shorn. The expense and trouble is too small to be mentioned, when compared to the profit, advantage, and humanity of the action."]

11. The *White Scour* is an uncommon looseness, occasioned by feeding sheep on putrescent vegetables; and particularly on the shells of turnips, which have been suffered to lie on the ground for some time, after the animals have eaten or scooped out the substance of the root. As soon as this malady appears, it has been directed to pulverize and sift half a pound of dry bay-salt, which is first to be gradually mixed with a pint of old verjuice, and then with half a pint of common gin. The diseased quadrupeds must be separated from the rest of the flock, and three large spoonfuls be given to each; the dose being repeated on the second or third succeeding day, according to the exigency of the case.

12. The STAGGERS; 13. The FOOT-HALT; 14. The FOOT-ROT; 15. The PELT-ROT; 16. The GALL; 17. The RICKETS; 18, The FLUX; for which respective disorders the reader is referred to the alphabet.

19. The *Sheep-fagg*, or *Hippobosca ovina*, is an insect well known to shepherds. Its beak, consisting of two valves, is cylindrical, obtuse, and pendent; and the feet have several claws. These depredators live among the wool: they materially prevent sheep from thriving, in consequence of the severity with which they bite, and the blood they extract from the tortured animals; but, on account of the hard shell, or cover surrounding them, they are with difficulty destroyed.....The remedy suggested by Sir JOSEPH BANKS for curing the ROT (which see), may also be safely applied to the extermination of the *Sheep-fagg*; as thus the quality of the wool will not be in the least impaired.

20. *Obstructions in the lacteal ducts of the udders of ewes*, after the lambs are yeaned. The whole udder is covered with hard tumors or knobs, which, in a short time become inflamed; and, if

the parts affected be not speedily relieved, a mortification will take place in the course of 24 hours; and the animal must consequently perish. As soon, therefore, as the tumors appear, it will be proper to clip off the wool closely to the skin, and to open the principal milk vessels with a razor, or similar sharp instrument; the morbid matter should then be expressed, and a little fresh butter applied to the wound. The ewe, thus affected, must be seperated from the flock; and, though perhaps losing the use of one teat, she may be suffered to suckle her lamb; but, if both teats be diseased, the latter must be reared *by hand*, and the dam fattened for sale.

[Mr. Livingston, in the *Transactions of the Agricultural Society*, New-York, observes that the legs of sheep are furnished with a duct, terminating in the fissure of the hoof; from which, when the animal is in health, there is secreted a white fluid, but when sickly, these ducts are stopped by the hardening of the fluid. He has in some instances found, that the sheep were relieved, merely by pressing out the hardened matter with the finger, from the orifice of the duct in each foot, and thinks that it may in some cases, be proper to place their feet in warm water, or to use a probe or hard brush, for cleansing this passage."]

Sheep are farther liable to be *bitten*, *torn*, or *worried*, from the carelessness, or impatience of the shepherd; or, from his dogs not being sufficiently *broken*, as well as from the dogs of other persons; in consequence of which, the wool is often injured, and its value greatly reduced. Such accidents, however, may be prevented by proper care and attention.

Lastly, to preserve the health of sheep, it will be advisable that every farmer, or breeder, daily inspect his flock, and take particular care, that their tails be kept perfectly clean: nor should they be folded two successive nights on the same spot; being more tender and obnoxious to disease than other quadrupeds.

No animal is more useful than the sheep, which supplies man with food and clothing, while it furnishes numerous poor families with constant employment, in the various branches of the woollen manufacture. Its milk is very nutritious, and its flesh is a grateful and wholesome food (see MUTTON); farther, the principal parts of the skin are advantageously converted into parchment; and the clippings, or shreds, are boiled into GLUE; a substance which is indispensable to carpenters, joiners, and cabinet-makers. The horns are formed into buttons, and various other articles of conveniency: the trotters afford, on expression, an oil which is usefully employed in several branches of the arts; and, when boiled, or baked, they furnish a nourishing repast. Lastly, their DUNG is a valuable manure; and even their bones, when reduced to ashes, constitute a principle ingredient in the compositions for artificial stones, for ornamental chimney-pieces, cornices, &c.

On account of these numerous useful purposes, the sheep has deservedly become an object of national consideration: it will, therefore, not be uninteresting to give a concise view of the different breeds, at present existing in Bri-

tain, and which is selected from Mr. CULLEY's practical *Observations on Live Stock*, 8vo. 2d edition, Robinsons, 1795.

			Average weight of fleece per lb.	Years old when killed.
1	Dishley	long wool	8	2
2	Lincolnshire	long wool	11	3
3	Tees-Water	long wool	9	2
4	Dartmore Natts	long wool	9	2½
5	Exmoor	ditto	6	2½
6	Dorsetshire	fine short wool	3½	3½
7	Herefordshire	very fine short wool	2	4½
8	South-Down	ditto	2½	2
9	Norfolk	fine short wool	2	3½
10	Heath	coarse long wool	3½	4½
11	Hardwick	short wool	2	4½
12	Chevoit	fine short wool	3	4½

[*AVERAGE PRICES OF NATIVE BRITISH WOOL.*

LONG WOOL.

Lincoln	20*s.* per tod of 28lb.	or	8½ per lb.
Leicester	21*s.* 6*d.* ditto,	or	8¾

SHORT WOOL.

Norfolk	48*s.* 6*d.* per tod of 28lb.	
South-Down		1*s.* 10*d.* per lb.
Hereford, trinded		2*s.* 5*d.*]

To these different breeds must be added, 1. The improved Gloucester, or the Cotswold Sheep, enlarged by the old Leicester Cross; producing full-sized and well-flavoured mutton: and, 2. The Staffordshire Cannock-heath Sheep, which resembles those of the South Down. Both these breeds are said to be susceptible of great improvement by crossing, and have been highly recommended to the attention of breeders.

Beside the native kinds, or varieties, of this valuable animal, we cannot in this place omit to mention the *Spanish Sheep*, which have within a few years been imported into Britain, with a view to improve the English breeds. Numerous experiments were consequently instituted, under the immediate superintendance of Lord SOMERVILLE, and the *Board of Agriculture*; which have been attended with the most desirable success. Nay, that patriotic nobleman lately performed a journey into Spain,

with the sole design of collecting a number of the finest Spanish sheep: and thence imported *twelve* rams. From his acknowledged skill in the symmetry of this valuable animal, we trust that they will be a real acquisition to the nation.

[The improvement of American wool, has for some years past been viewed by the editor, as a concern of *national importance*, and he has taken some pains to make himself acquainted with the best means to effect so valuable an object.

Europe is indebted to the United States, for cotton of the finest quality, and of the longest staple, in the world. If the prediction of this fact had been made fifteen years ago, or even the suggestion hinted, that we should at the present day, supply the deficiency of cotton, at the British market, and that our production would even obtain a preference from the manufacturers of Manchester; it would have been deemed equally wild and improbable as the assertion now made, may be thought, *that nothing* but our own *indolence will prevent the article* of wool, being in 20 years, as much an American staple, as cotton, tobacco or wheat.

The following directions will be found useful, by those who are inclined to improve the breed of sheep, for wool. They are taken *chiefly* from Dr. ANDERSON, and other late practical writers.

1. Fineness of pile and softness of texture, are the peculiarities chiefly wanted.

2. When two or more sheep are found in a flock, which are entirely equal in these respects, that one which has the fewest hairs through the fleece, ought to be preferred, for although these hairs may be seperated, as the natives of Shetland experience, by letting the wool rise entirely from the skin, without being shorn, yet in large flocks that practice would be very inconvenient.

3. If fineness of pile and purity are equal, that sheep which has the closest pile, or thickest fleece, should be preferred.

4. If fineness, purity, and closeness of pile, be equal, prefer that which has the greatest uniformity in the texture of the whole fleece.

5. All the above named particulars being equal, the general shape and figure of the animal ought to influence the choice. A *round compact body*, a *full* and *deep chest*, *straight back*, *straight firm legs*, *(neither very long, nor too short;)* and a *strong hardy figure*, upon the whole, with a lively mild looking eye; are the particulars respecting shape, that should be preferred: but this circumstance should be a subordinate consideration to those already enumerated.

6. All other circumstances being equal, that sheep which is in the best condition at the time, if their pasture has been nearly equal, should be preferred.

7. If two sheep are equal in all the foregoing respects, that which is of the larger size, may be preferred.

8. Ewes should be chosen as nearly as can be found, of the same quality with the ram. It is only after the best breeds are once obtained pure, that experiments should be tried, to see what will be the effect of crossing with others.

9. In every case, the colour ought to be particularly adverted to, and though there may be excep-

tions, it will be found, that a pure white breed, is, upon the whole, best calculated for general use, as white wool admits of being dyed of all colours with greater facility than any other. If, however, any one incline to try to improve a particular colour, it may be a very proper subject for experiment..... But, in every case of this sort, the ram and ewes selected, ought to be exactly of the same kind, and should be carefully put apart by themselves, till such a quantity of this wool could be obtained, as might serve, to ascertain what were its peculiar qualities, and its intrinsic value. In no case should any sheep be selected to breed from, that are spotted in any way, for this peculiarity can never be beneficial to the rearer.

Those who have not adverted to the effects produced by selecting proper breeds of sheep, for breeding from, but who have been accustomed to let their sheep run promiscuously, and breed together without any selection, can have no idea of the surprising effect that an attention continued for a few years, would have, on improving the wool, the shape, and the general hardiness of their whole flock; and will therefore be inclined to look upon these directions as unnecessary refinements:.....but the farmer may rely, that these observations are the result of experience, and not of speculative reasoning; and that, if any of them shall make trial of selecting a few sheep, and of secluding them during the rutting season, from all others, they will themselves be astonished at the effects, and they would be very agreeably surprised, to find, that they might be able to obtain from 6 to 12 cents per pound more, for their wool, than their neighbour who was not careful. It deserves also to be mentioned as an important and well substantiated fact, that the sheep which carry the finest wool, if carefully selected, are in general equally hardy, and as easily fed, and carry fleeces of equal weight, with other sheep, yielding the coarsest wool.

A small size in sheep, is no way connected with the quality of the wool: the finest woolled Spanish sheep, is a large well bodied hardy animal, and the Thibet sheep which carry the finest wool in the world is still of a larger size. Fine wool, therefore, may be obtained without diminishing the size of the carcase of the sheep in the smallest degree, and also without diminishing the weight of the fleece, or losing any other peculiarity that could render any particular breed desirable. This would, no doubt, require pains, and a careful selection of the best breeds, wherever they could be found, and an attentive and cautious procedure, but no one can easily imagine, how much can be done by attention in this respect. Mr. Bakewell, the famous breeder at Dishley, Leicestershire, in England, began with a few good sheep; and yet by a course of good management, brought his sheep, to a degree of perfection hardly credible by American farmers. Dr. Anderson continued his experiments but three years, and yet even in that time, he had some wool that measured full half a yard in length, which was equally fine with the best Spanish wool, and much softer than to the touch. If such were the effects of only three

years attention, in a situation that did not admit of an accurate seclusion of different breeds at the rutting season, what might be expected from a course of experiments conducted on a more enlarged principle, in a place where an entire seclusion of breeds could be easily affected, continued for half a century? No one can pretend to say to what perfection we might arrive.

Experiments made by various persons have clearly proved, that the permanent qualities of any breed of sheep can only be affected by a change in the parent stock, and that of course, if a new good breed be introduced into the country, it will infallibly be debased by intermixing with the native breed, unless a *careful*, and *entire seclusion* of them shall be made at the rutting season. Let the farmer, therefore, who is disposed to improve his wool, examine his present stock, and pick out all those of the finest fleeces, and part with the rest. Let him add to this stock, all those of equal fineness, which he may meet with among the droves; if he should find any sheep with a wool of a finer quality, let him buy these also, and if convenient, they may be kept, or let him part with his former stock, and keep his last purchase, and set them apart for the experiment. By persevering in this way, our farmers may be enabled, in time, to rear, not only as fine wool as is obtained from any other country, but may also be able to conjoin with it every other valuable peculiarity, such as closeness of fleece, a good mould of carcase, hardiness, a capability of being easily fattened, largeness of size, and every other valuable quality, adapted to every peculiarity of situation of our country; or they may be enabled to ascertain the value of any particular breed of sheep, that might be suspected to possess particular excellencies, so as to enable those who are concerned, to speak with certainty of the particular value of each, and the circumstances in which one kind could be kept with greater profit than another.

One caution must be suggested, which our own observation proves, to be highly necessary, with respect to the introduction of strange cattle among other cattle on farms: and that is, the danger of disease. It is not necessary that the strange cattle should be actually sick to produce this sad effect; for, in the year 1796, the editor saw a drove of cattle from North Carolina, which though apparently in good health, yet left their marks in every town, or neighbourhood in which they stopped, between ANDERSON'S ferry, above Lancaster (where he first saw them); down to the meadows adjacent to the health-office, on State Island, where the editor then resided.....See vol. ii. p. 51. The same thing may happen to sheep. When, therefore, any addition is to be made to the old stock, the strangers should be gradually introduced, carefully watched, and a separation of the diseased from the healthy ought to take place, the first moment indisposition appears in the flocks.

The varieties of sheep are great. Some are distinguished for fineness of wool, and for flavour of flesh; others for short wool, bare bellies, and for bringing very early lambs; others for smallness of size, and superior fineness of wool; others, as Mr. BAKEWELL'S breed,

for small bones, fineness of flesh, lightness of offal, disposition to quietness, and consequently, to mature and fatten with less food, than other sheep of equal weight; and again, some for carrying long coarse wool, and their fat outside, and some for carrying it within, and having the lean marbled with fat; and although our American sheep, have hitherto been almost universally permitted to have an unrestrained intercourse with one another, yet it is highly probable, that in some districts, sheep may be found possessing one or more of the above peculiarities, and when they do appear, endeavours ought to be made to keep the breed pure, or cautiously to cross it with others, that may possess some other valuable peculiarity. It is by a proper admixture of two breeds, with a judicious selection of the *best varieties* thrown out from them, that can insure a breeder success: to obtain which requires great attention, not only to know the best sheep, and of what descent when living, but in seeing them cut up after they are dead: for when the improvement of the carcase is the object, we should breed from the descendants of such only, as "*cut up well*," for one injudicious cross may cost many years to repair the injury it may occasion, and the life of man is too short to allow of many such errors.

Having obtained a good breed of sheep, the next object of the farmer should be, to preserve it pure and unmixed....For this purpose, the most certain plan would be to keep no other breed upon his farm, for experience proves that during the rutting-season, no fences the farmer can rear, are sufficient to keep them separate. They therefore mix and degenerate, in spite of every effort that can be made to prevent it.

It has been generally supposed, that to prevent the degeneracy of any particular breed, it is necessary to breed from males and females not related to each other: but this is now found to be as great a mistake, as the prejudice respecting the necessity of changing seed, which has been so fully disproved, by Mr. Joseph Cooper of New-Jersey. Good animals and good seed, will always preserve their original excellence under the same circumstances, and experience has fully proved, that any one breed may be kept perfectly uncontaminated for any length of time, with all its distinctive peculiarities entire, merely by preventing an intermixture. It was by a careful attention to this principle, that the late Mr. Bakewell obtained such an ascendency over every other man in England, for the various breeds of his animals.

The food of sheep has a very considerable influence upon the flesh and fleece. They are particularly fond of *Festuca ovina* (or sheep's fescue-grass), of *Achillea Millefolium* or yarrow, of *Plantago lanceolata* (or rib-grass, narrow-leaved plantain), and of *Mellilotus officinalis*, (or common melilot)..... Salt pasture is also highly beneficial in heightning the flavour of the flesh, and increasing the fineness of the wool.

The sheep of the Shetland islands, notwithstanding the inclemency of the weather, produce wool of the finest quality. We also know, that the sheep from Cape-May, Shrewsbury, and the high lands of Neversink, in N. Jersey, produce the finest mutton and

wool, of any brought to our market.

Salt is essentially necessary to sheep, and should be freely given. In Spain they allow one pound and a half a-season to each animal. It is given to them upon flat stones, placed about 20 feet from one another. This practice should never be neglected.

The citizens resident in the lime-stone districts of the country, should turn their attention to the raising of sheep: as they will be saved the expence of salt, which may be an object where a large flock is kept.

In England, no one attentive to the preservation of the quality of wool, ever puts a ewe to a ram before the second or third year of her age. This practice ought to be carefully followed in the United States, for obvious reasons. The strength of the animal by that time, is perfect, its character, disposition and peculiarities are fully evolved, and of course will be capable of more completely transmitting them to its offspring, than by becoming a parent at a more early period, and before its constitution is fully formed, and before its native good qualities are rendered apparent.

It is of great importance to the beauty of the animal, that nothing interrupt its growth during the first year.

By experiments in England, it appears that the first cross, of a new breed, gives to the lamb half of the ram's blood, or 50 per cent,

The second gives 75 do.
The third $87\frac{1}{2}$ do.
The fourth $93\frac{3}{4}$ do.

At which period it is said, that if the ewes have been judiciously selected, the difference of wool between the original stock, and the mixed breed, is scarcely to be discerned.

Lord SOMERVILLE says, that "In addition to a most admirable systematic management of the flocks of sheep in Spain, the superiority of the wool may depend upon *three* circumstances. 1. The use of salt: this prevents the injury arising from an *acidity of stomach*, a serious disorder, and common to sheep, particularly when stocked on green floaty food, such as turnips, vetches, or young clover. The salt is spread on tiles or slates, among which the sheep are driven. On lime-stone soils, none is required. 2. To the practice of rubbing into the wool, red or yellow earth, in September. It is supposed to mix with, and qualify the perspiration, (which would otherwise give an asperity to the wool,) and to form a coat impenetrable to rain or cold. 3. To their changing their climate with the season, so as to preserve an equal temperature of air*. Spanish flocks are never let out of the fold to feed, until the morning dews have been evaporated. This prevents the *liver-rot:* probably the foot-rot of England is owing to the dews, as this disease never appears before the 25th of August.

Spanish sheep are sweated a day or two before shearing, to make the wool part easily from the body, and are carefully housed during the night, or in cold, raw weather, for some days after shearing.

In England, Lord S. finds, that the sheep with large throats are not good in their skins, and evince

* This opinion, however, is not correct, as is proved in the present article. EDITOR.

no aptitude to fatten; the Ryeland breed is an exception. This last, like the Spanish breed, carries wool of such high value, as to counterbalance the ill impression of throatiness. Their skins are full as good, and in some instances more *clear and rosy, a sure token of vigour* and consequent disposition to fatten. Dr. GARNETT's analysis of the substance rubbed on the wool of the Spanish sheep, proves it to be a kind of Fuller's earth (but not an *ochre*) of a soapy nature.

Lord S. says the Spanish rams have a buff tinge in their countenance, they may reach 17 lb. a quarter, when tolerably fat. The ewes are not low on their legs, are *very fine in bone*, and may reach 11 lb. a quarter." See "A report of the system followed during the two last years by the Board of Agriculture, by Lord SOMERVILLE," 8. vo. London, 1800.

The following excellent extract, is part of a paper presented last year, to the *Boston Society of Agriculture*, by DAVID HUMPHREYS, the late minister of the United States to Portugal, which it is to be regretted, has not been given entire. Mr. H. has laid the foundation for great wealth to this country, by bringing over with him, on his return from Spain, one hundred Merino sheep, which he has let out on the most liberal terms. As a compliment for the meritorious act, the *Boston Society* has presented Mr. HUMPHREYS with a gold medal.

"In Spain, two distinct species of sheep have for ages existed, the one named Merinos, famous for their short and fine wool, peculiarly fit for carding; the other denominated Churros, distinguished for their long and coarse wool, more suitable for combing. The former are so precious, as to be sought with eagerness by all who wish to meliorate the staple for the woollen manufactory in any country of Europe; while the latter, though much larger in size, are in so little estimation as never to be procured for exportation. My statements and remarks will be confined to the Merinos. The height of the male is about the same as that of the ordinary breed in this country. The head appears rather bigger and straighter. The ears are very small. The eyes remarkably bright. The horns curved in a spiral turn. The neck is short. The chest broad. The members more compact and thick, than those of our former breed of Sheep; and the carcase is thought to have smaller bones and to be more rounded in the hinder part. The body, face, and legs, are covered with a delicate fleece, which grows amazingly thick, without any mixture or coarser locks of hairs. This fleece is remarked to be much more impregnated than that of any other breed, with an oily substance, apparently exuded in perspiration. This animal is perfectly gentle, but quick, firm, and regular in all his movements. The female is considered generally as having the more characteristics of the pure blood, in proportion as she approximates to this description....yet the ewes are commonly destitute of horns.

"A few well attested facts will serve to shew the value of this race. None of the superfine cloths made in England, France, or Holland, can be fabricated without the mixture of a certain portion of this wool.....The price is more than

twice as high per pound, as it is for ordinary kinds. I shall mention, in another place, the increased weight of the fleece, when this breed are transferred from Spain to another country, upon the testimony of those concerned in their management....That the flesh is not less succulent or well flavoured than the best English or American mutton, I have had frequent opportunities to decide for myself. It is understood that the Merinos are more easily maintained and fattened than the taller and larger breed, insomuch that there are persons acquainted with both breeds who calculate that 200 of these small boned and short legged sheep may be kept in tolerably good condition, where 20 of the other would suffer for want.

" To establish a strong presumption in favour of the following point, viz. that the race then contemplated to be introduced into the United States, was likely to preserve all those qualities which constituted the original superiority of value, I need only refer to the propagation of a breed from the same stock, with fleeces augmented in quantity, and undiminished in fineness,in Great Britain, France, Holland,* Switzerland, Germany, Denmark, and Sweden. In the most northern climate to which they have been carried, they have supported the cold perfectly well, and even without suffering any injury from having been in some instances buried for a time under the snow....At the national farm of Rambouilet, in France, they are reported, on good authority, to have not only resisted the unfavourable influence of a situation naturally too low and moist, but to have preserved their wool in all its original fineness, and to have increased the weight to an asfonishing degree.

" It is fact confirmed by experience beyond contradiction, that the quality of the wool does not depend on the quality of the pastures in Spain, because the same pastures have maintained, from time immemorial, two different breeds, which have never assimilated ; one remarkable for the shortness and fineness, the other for the length and coarseness of the wool. It is moreover equally well proved, that the quality does not depend on the journies which the greater part of the Merinos make annually, because there are other flooks of the same race which remain perpetually in the same district, and whose fleeces are of the same consistency precisely as the others. The flocks that do travel,or do not travel,which are nourished with plentiful food, and taken good care of, by excluding the deformed, sick and weak from becoming breeders, are preserved in all the purity of the original stock....while those in either predicament, migrating or resident, which are subjected to feel the effects of scarcity and negligence, invariably degenerate.†

* These facts are confirmed by Cit. Lasteyrie, in his report to the Philom. Soc. at Paris....Editor.

† Burgoanne, an author of undoubted credit, proves, that the annual perigrinations of the Merino sheep, are owing to the scarcity of food, and to the multitudes of sheep, that are kept together, and not to any conviction of the importance of continuing in the same climate all the year. Cit. Lasteyrie's, fact before quoted, also confirms Mr. Humphrey's assertion....Editor.

"The vigilance of the Shepherds, in remaining day and night with their charge, in reserving the best formed and finest woolled only for breeding, and in knowing and attending to each individual of their flocks, has, doubtless, contributed much to preserve them from degenerating down to the present day.

"This breed, like most of all others, thrives best in uplands and short pastures; but it is reputed to be so singularly hardy, as to endure rain, snow, and cold as well as any northern race, and to support itself in parched southern climates, by feeding on weeds and vegetables which most others would not taste....Without entering into the detail of enriching the land, on which they graze or are folded, by their manure, especially where a rotation of crops is systematically pursued, I should not omit to mention, it has been asserted, that a moderate sized farm, for example, a hundred acres, skilfully manured, may be made to maintain 100 sheep, and moreover, to produce as much in crops as it would have done had it been employed only in cultivation, and not charged with their nourishment.

"That rams have been let for the season in England, for from 100 to 1000 guineas each, is a fact sufficiently known, to those who are acquainted with the history of agricultural proceedings in that country; and it demonstrates conclusively the wonderful passion that prevails for bettering the breed. The successful experiments in France, on the same subject, have been announced in a manner which demands credit. At Rambouillet, a farm originally appropriated for making improvements by the ancient Government, which is represented not to be a very good position, on account of its humidity, a pure Spanish stock has been maintained for many years by the attention and care of the superintendants, not only in a perfectly healthy but gradually improving condition, in such sort that the quality of the wool is as fine as that of the best Merinos actually in Spain, while the quantity is considerable more than doubled. Where large flocks are kept in the last mentioned country, the sheep do not produce, upon an average, more than from two to three pounds. The rams at Rambouillet, yield from 10 to 12, and the ewes from 5 to 6 each. From this stock, many small flocks, both of the pure and mixed breeds have descended.

"Several intelligent authors in Europe, who have treated of the most speedy and efficacious modes of improving wool, have stated, that, where the smallness of the original stock of Merinos prevents so rapid a propagation of the pure race as could be wished, a mixed breed may be produced by Spanish rams, and well chosen ewes of the country, whose descendants in the fourth or fifth generation, will yield fleeces nearly or quite as fine as the first quality of those which are produced in Spain."

Shearing Lambs....It has been a question, whether the practice of shearing lambs, is prejudicial or useful. By a publication addressed to the *Philadelphia Society of Agriculture*, (*American Museum*, vol. 9, p. 111,) by Dr. LOGAN, it appears, that he sheared three lambs in August, which had been yeaned

the preceding March, and that the wool, taken the following spring from the same animals, though not so long as that of two others, yeaned at the same time, but not shorn until the spring after, yet the fleeces were much thicker, equally fine, and not the least matted :.... and he is so convinced of the profit and utility of the practice, that he intends to continue it. Mr. JOHN PHILIPS, of the township of Pittstown, Luzerne county, Pennsylvania, has also announced in the Wilksbarre Gazette of August 27, last, that "he sheared from six lambs, fourteen pounds and four ounces of wool; and that he is convinced by seventeen years experience, of the great advantage in shearing lambs: although the wool will not be so long the next spring, yet it will be much thicker than on those which are not shorn; and the lambs that are shorn will not loose their wool like those that are not shorn. Besides shearing will relieve them from ticks, and they will certainly grow better and make larger sheep." Mr. P. shears his lambs *soon after the new moon*, in the last of July, or first of August.

The testimony of two American farmers, (and that of others, might be here added) deserves attention; and yet it may be well to state, that from a report made by TESSIER and HUZARD, concerning the flock of Spanish sheep at Rambouillet, (the French experimental farm) it appears that some sheep were allowed to be two years without being sheared, and their fleeces were found to be twice as heavy, and twice as long as the yearly fleece of those, which had been sheared twice in the same period; nor did the animals thmeselves appear to be at all incommoded.

Mr. Chancellor LIVINGSTON, adds, another reason given him by Mr. BOURGEOIS, the superintendant of the French national farm, for waiting till the second year before shearing, viz. that the ewes are worth less than the wool they yield, and that the weight of the first fleece at the age of 18 months, is equal to that of the two shearings in the old way.

The state of VERMONT has set a praise worthy example to the other states, by a law passed last year, deducting from the poor man's poll tax the full of its amount, on his proving that he keeps and shears 20 sheep; the law likewise protects the poor man's last ten sheep from attachment or execution.

The following article is taken from a public print, published some years since....of its importance the editor has no proof.

To take off the wool from a sheep-skin...." As soon as the skin is taken off, spread it on a horse or cow; and in six or eight hours, the wool will come off better than in any other way. After the wool is off, spread the skin on a pole, and let it hang in the shade, till convenient to send it to a tanner."...*Connecticut Gazette.*

To preserve the skins with the wool on....Spread the skin against a fence, or on boards, and wash the inside well with salt and water: then with alum water three times a day: rub it well after each washing with a flat piece of wood, sawed off the end of a small log, to soften the skin....See article WOOL.]

SHEEP'S-BIT, or HAIRY SHEEP'S-SCABIOUS, *Jasione mon-*

tana, L. an indigenous annual plant, growing in meadows, pastures, and heaths, in dry and sandy situations; where it blows in June and July.....Its blue flowers emit a strong, musky odour; and are eagerly visited by bees. The leaves contain a sweetish mucilage; on which account they afford grateful food to sheep.

SHEPHERD'S NEEDLE. See NEEDLE, the Common Shepherd's.

SHEPHERD'S PURSE, the COMMON, or SHEPHERD'S POUCH, *Thlaspi Bursa pastoris*, L. a native plant, growing among rubbish, on road-sides, walls, in corn-fields, and gravelly walks; flowering from March to September....Dr. WITHERING observes, that this herb evinces the influence of soil and climate on vegetables; as it thrives in almost any place, bears flowers, and perfect seeds, when only two inches high; while, in more favourable situations, it attains the height of two or three feet.

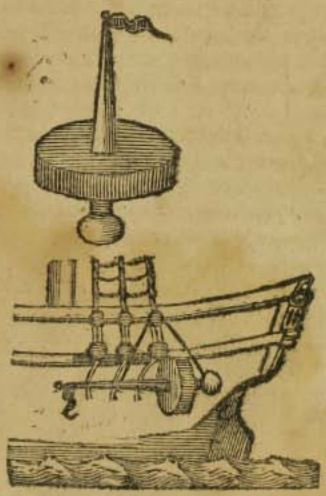
According to BRADLEY, the dried leaves of the Shepherd's Purse, reduced to powder, and taken in red wine, form an efficacious remedy in diarrhœas, and other fluxes, where astringents are indicated....The expressed juice of this plant, operates as a powerful styptic, especially in bleedings from the nose, when introduced into the nostrils.

SHINGLES, a disorder of the erysipelatous kind (see ROSE), in which numerous pimples of a livid hue, arise in different parts of the trunk, but principally around the waist of the body; whence it is called *shingles*, or *girdle:* the eruption terminates in small blisters or pustules. It is seldom attended with fever; and, even in such case, the febrile symptoms are generally mild.

As this complaint requires a similar treatment to that already stated, under the head of ROSE, we shall only add the salutary caution to refrain from all external applications of a *repelling* nature; because such imprudent remedies, here likewise, cannot fail to produce melancholy effects.

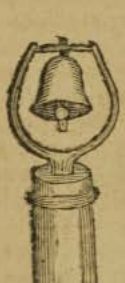
[SHIP.....Under this head, may be noticed a very useful contrivance to save a person who may chance to fall over board at sea, which is described by Lord HENNIKER in the report of the *Humane Society* of London, for 1802.

It is called a MAN-SAVER; and resembles, in some measure, "a *Tee totum;*" the floating part is like a drum-head of a capstan, and made either of cork, or hooped like a cask; the pole run through it, serves for the man to hold by, as well as with the flag on the top, a guide for the ship's boat to find it;



and the weight at bottom to act as a counterpoise to keep the pole upright. They are no trouble, as they are made fast to the mizen chains, and let go, (by cutting the lashing) in one minute, into the sea.

Lord H. adds, "if a little bell was fixed in a light iron crutch, upon the top of the pole, instead of the flag, the motion of the waves would keep it constantly ringing; and on a dark night, would be the best direction, to either the sailor in the water, or the boat to fetch him. I submitted this thought to one of our admirals, who had saved a man that fell off the fore-yard, by one of these things, which was lashed as described above; and he much approved of the alteration." The following cut will give a good idea of the plan proposed.



An account of a contrivance similar to the *man-saver*, was published in the American prints, and is preserved in CAREY'S *American Museum*. It was said to have been seen on board a Maltese ship of war.

SHIP-BREAD, or *Biscuit*..... Under the article BISCUIT, the reader will find an abridgement of an excellent paper on biscuit, originally written in French, by the useful PARMENTIER, to whom we are indebted for numerous papers on economical subjects, and translated at length in 34th vol. of YOUNG'S *Annals*. The following receipt, which is taken from Mr. BORDLEY'S "*Notes on Husbandry*," will enable persons on board ship, (unless prevented by stormy weather) to have fresh biscuit at all times..... "Add water to the flour very gradually, so as not to drown the flour. Work up the dough until very dry, with hands; so that when all is done that can be done by hands, towards gathering the materials into a firm mass, it is still dry in parts, and in cracks with flour not taken up. The mass is then to be committed to a brake or heavy beater, with which it is well worked, until it becomes smooth and solid, and the oven heated to bake as quickly as possible without burning"....Common house bread by being baked a second time, will keep much longer than that which is baked but once.

The preservation of bread and biscuit from wevills, on ship board, is a great object. The entire exemption from those insects, of a parcel of biscuit put up in a bag which had fallen into a kettle containing a solution of salt-petre; while other parcels, stowed in the same place, were greatly eaten, has lately led to the recommendation of immersing the bags in a kettle of salt-petre solution, and drying them before being filled with biscuit; the experiment is certainly worth repeating. Lining the bread-barrels with lead, and keeping them tight, would doubtless answer.]

SHOAD-STONE, a term ap-

plied to certain loose masses of a fossil, which is generally found at the entrance of mines.

Shoad-stones serve as useful guides to miners, in digging for ores; because, if these minerals be very ponderous, it may with certainty be concluded that they contain antimony, or some other metal. Being principally found in Cornwall and Derbyshire, it is probable from the large portion of *marcasitic* particles in *shoad-stones*, that MUNDIC may thence be advantageously extracted.

SHOE, a well-known article of dress, which serves to cover the feet.

Shoes are generally made of leather, the texture of which ought not only to be sufficiently close, to exclude moisture, but also pliant, or flexible; so that it may afford free scope for the motion of the foot: and, as it is an object of material consequence to be provided against the sudden changes of the weather, we refer the reader to the [1st vol. p. 343, and vol. 3d. p. 452,] in which he will meet with the most approved methods of rendering leather *water-proof*.

[To the receipts given in places above referred to, may be added the following, communicated by Mr. JOHNSON, of New-Brunswick.

Take five parts tallow, seven ditto bees-wax, twelve ditto size, one ditto brown soap, four ditto lamp-black; incorporate the whole over a fire, (adding the ingredients one by one, and stirring the mass well,) then make it into cakes.

The size is either glue dissolved in water to a jelly, or else strong jelly made of gum tragacanth in water; or a jelly made by boiling glue pieces (bought of tanners) in water, to a proper consistency, and strained.

Blacking made agreeably to the foregoing receipt, feeds the leather, and when brushed bright, gives it the colour and appearance of new leather. It is also best adapted for cleaning ladies' Morocco shoes: and, if it be required to make it more shining, more size may be added.]

Next to the substance of which shoes are manufactured, the most important consideration will be their *size*, or shape; which should in all cases be adapted to the foot. An easy shoe must, therefore, be of a sufficient length, and of a proportionate breadth. The soles should be thick, and their extremities, round rather than pointed; in order to protect the toes from being injured by sharp stones, or other rough substances, that may occur in the streets or roads.... Such are the requisites for obtaining a convenient shoe; and, if these be not strictly observed, the necessary perspiration of the feet will be checked; warts and corns, with all their attendant pains, will arise; and numerous other maladies will be induced.....extending their influence to other parts of the body. Beside these serious consequences, which persons wearing narrow or fashionable shoes, gradually, though certainly, experience, they also suffer from immediate fatigue and languor, when walking only to a short distance; whereas, by pursuing a contrary conduct, the feet are not only *more easy*, but those who wear *proper* shoes, are enabled to undergo the longest *pedestrian* journies, without receiving any material injury from such exertions...See also the article FOOT.

SHOE, in *farriery*, is an iron plate of various degrees of thick-

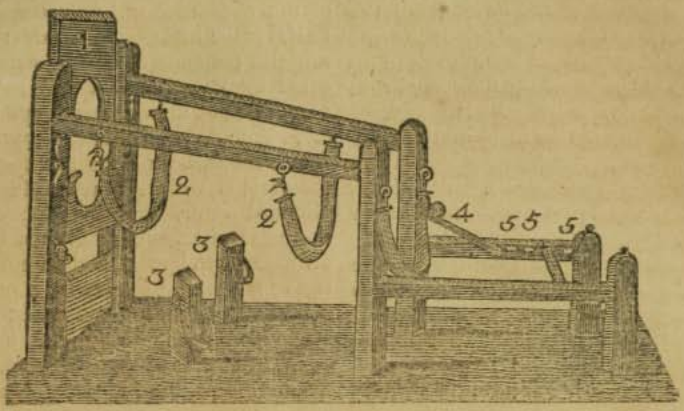
ness, designed to protect the feet of horses.

The common method of shoeing consists, first, in paring the frog, sole, and binders of the foot: so that, by clumsy management a flow of blood is frequently occasioned: next, a heavy shoe, which is made somewhat concave on the side next the hoof, is then applied nearly *red-hot*. Farther, to prevent the frog from coming in contact with the ground, the *shoe-heels* are usually made either very thick, broad, and strong; or large cramps or caulkers are raised upon them. In consequence of this treatment, the frog is unnaturally elevated above the ground, and the *heels* are deprived of the substance which was originally intended to keep the *crust* sufficiently expanded. Thus, the former are forced together; and, while the latter is pressed upon the *coffin*, and the extremities of the *nut-bone*, the circulation of the blood is impeded; the frog gradually wastes; at length the whole hoof decays; and, by such injudicious practice, the numerous disorders incident to the feet of horses, which are known under the names of FOUNDERED, FRUSH, &c. are generally occasioned.

To remedy, or at least to prevent, these maladies, Mr. EDWARD COLEMAN has invented an *artificial frog*, for which he obtained a patent in February, 1800. This frog may be made of any tough and hard material; for instance, leather, horn, or wood; but iron is preferable. In order to fix and remove such contrivance with ease, the toe of the iron frog extends beneath that of the shoe, and thus prevents the artificial frog from slipping forwards: next, a steel spring is fitted into an irregular groove in the iron frog, and fixed under the heels of the shoe; lest the frog should move either backwards, or in a lateral direction.... Lastly, to ensure greater steadiness to this application, a leather strap is passed through a hole, in the heel of the frog, and then buckled round the hoof.

In April, 1796, a patent was granted to Mr. WILLIAM MORECROFT, for his invention of an improved and expeditious method of manufacturing horse-shoes. His practice consists in cutting the shoes by means of dies, having previously prepared the iron; in consequence of which, the shape of the shoe is not only more perfect, but the horse's foot is supported in a more effectual manner, than by the shoes in common use: thus, in the opinion of the patentee, many diseases to which that part is liable, may in future be prevented. For a detailed account of this contrivance, the reader will consult the 6th vol. of the "*Repertory of Arts*," &c.:.....some judicious hints, on the shoeing of that valuable animal, also occur in Mr. MOORCROFT'S pamphlet, entitled, "*A Cursory Account of the various Methods of Shoeing Horses*," 8vo. 1800; which will amply repay the trouble of perusal.

[Under the article OXEN, the great advantage of shoeing oxen was mentioned, and reference was made to a machine to facilitate the operation, represented in the 26th vol. of the *Annals of Agriculture*. The subjoined cut will give an accurate idea of the apparatus.



1, is the top piece of the sliding plank, to sink down and confine the head.

22, are the broad, strong, straps of leather, fastened by links of iron, to prevent the ox from lying down on his belly, which they are apt to do; and the hinder strap is to prevent his drawing back, to the injury of his head and neck.

33, are two stumps strongly fixed in the ground, to tie the fore legs to.

4, is an iron that lifts up and down, to confine the roller to which the hinder legs are tied for shoeing.

555, are holes (with others corresponding, not seen in the plate) for the roller to be shifted according to the length of the ox.

The machine would also answer for shoeing a refractory horse.]

SHOT, a general name given to small and large balls, employed in fire arms, but especially to those of a diminutive size.

Shot is made either of iron, or of lead: the former metal is chiefly used for cannon-balls; as the latter is for those of guns, pistols, &c.

There are different kinds of shot, according to the various purposes for which they are designed. The best for *fowling-pieces*, is known under the name of *Patent milled Shot*, and is of various sizes, according to the species of game that is the immediate object of pursuit. It is made in the following manner: Sheets of lead, the thickness of which corresponds with the intended size of the shot, are first cut into small cubic pieces: these are next submitted to a large, hollow, iron cylinder, that is mounted horizontally, so as to be turned by a winch; and, by their friction against the sides of the machine, they are rendered perfectly round and smooth....See also GRANULATION.

SHOULDER, is the joint which connects the arm with the body. The principal affection of this limb is LUXATION, or dislocation (see vol. iii. p. 515), when the head of

the upper arm-bone is forced from its socket. Such injury may be discovered by the swelling of the part; the inability to raise the arm; and violent pain attending the attempt: farther, the dislocated arm will be of a different length from the other; the head of the bone may be felt to be displaced from its natural situation; and a vacuity be perceived under the anterior part of the shoulder-blade.

In treating this complaint, the principal object will be to reduce the dislocated limb, with the greatest possible ease and expedition; in order to prevent a watery-swelling, which is apt to arise in neglected cases of long standing. Various means have been devised for restoring the joint to its former position; such as suspending the patient by the luxated arm over the step of a laddder, or the top of a door; and which have, in many instances, been attended with success, by the sudden jerk thus produced: but, by either of these expedients, the soft parts are liable to be lacerated, and the head of the bone to be fractured.

A more eligible method, therefore, is the following: after the patient is seated on a chair, his body must be secured by a strong belt passed around it, and held by assistants. The elbow should be bent, in order to relax the muscles. A firm leather bandage, from four to five inches broad, with strong straps, is next to be tied round the arm, immediately above the elbow; when the arm should be gradually extended by assistants, pulling these straps, while another person withdraws the shoulder-blade. The extension and counter-extension must be regulated by the situation of the head of the bone. As soon as the latter has passed the margin of the socket, it will be returned to its place by the action of the muscles; an effect which is indicated by a loud crack. If, however, violent inflammatory symptoms should ensue after the operation, recourse must be had to fomentations with Arquebusade or Goulard-water, and the application of leeches. At all events, the arm ought to be retained for some time in a state of rest, by a proper bandage, till it acquire its former vigour; especially if a new dislocation of the joint be apprehended. To obviate such an accident, blisters, frictions, and stimulants, applied to the shoulders, have frequently proved beneficial.

SHRUB, in *botany*, a term denoting a low tree, of a diminutive size; or, a plant abounding with branches; and, instead of one single trunk, shooting forth several sets or stems from the parent-root. Such are the honey-suckle, holly, furze, &c.

The most hardy, indigenous shrubs, are the Box, and Ivy, which resist the severest winters, without receiving the least injury; while many other vegetables decay, in consequence of intense frost. Next, in point of hardiness, are the Holly, Juniper, and Furze; but there are, besides, numerous ornamental shrubs, well calculated to diversify, parks, lawns, &c.....See the heads, Cuttings, Layers, Planting.

SHRUB, a compound liquor, made of ardent spirits, orange-juice, and sugar.

Though we do not profess to be acquainted with the exact proportion of the ingredients employed by *shrub-drinkers*, yet it appears

that one pint of the best coniac brandy requires to be diluted with the expressed and filtered juice of four or six China oranges, and half a pound of refined sugar..... Thus, a very palatable, but seductive liquor is produced; the effects of which, if frequently resorted to, cannot fail of undermining the constitution of its votaries....Having, on former occasions, explained the injurious consequences to be apprehended from the liberal use of ARRACK, BRANDY, GIN, and RUM, we shall, at present, only remark, that *shrub* is incomparably more *tempting* and insinuating, especially to weak females, than any of the *simple* spirits; because, in combination with *sweet* ingredients, this liquor imperceptibly stimulates, and gradually impairs the digestive organs, while it deprives such persons of that share of tottering health, which they vainly hoped to support.

[The above observation of Dr. W. is certainly correct: but as occasions often occur, when a glass of pleasant cordial may be properly, nay, usefully taken, the following receipt for shrub, communicated by Mr. JOHNSON of N. Brunswick is given.

Take of fourth proof rum, three gallons, add thereto the outer rinds of six Sevile or sour oranges, and of six lemons, and let these infuse for one or two days, then add three gallons of water, five pounds of sugar, and of sweet-orange juice, three quarts; when well mixed and settled, fine with a gill or half-pint of milk, and rack off for use.]

SIGHT, is the exercise of the sense of vision. This faculty is one of the most important enjoyed by organized beings; as they are thus enabled to behold the beauties of Nature, and to avoid such objects, as may be productive of injury to the animal body. Consistently with our limits, we cannot attempt to explain the peculiar structure of the organs of *sight*; and shall, therefore, briefly observe, that perceptions of the eye are effected by the refraction of the rays of light, through the medium of the chrystalline humour; till they are collected into one distinct image on the *retina*, a membrane resembling a net; and which represents objects to the mind. Such rays are, during their passage through the *cornea*, or horny skin, broken and brought into mutual contact; after which they converge at the part containing the viterous or transparent humour; and at which they separate, being again assembled together, and at length collected into as many points as the external figure represents.

Such is the manner in which we are enabled to behold objects in general: hence, the necessity of guarding the eyes with equal care against all injuries from without, as well as nocturnal excesses, becomes evident; for those tender and complicated organs are exposed to a variety of disorders, which, if not opportunely prevented or checked in their progress, may eventually induce total BLINDNESS.....Having already enumerated such affections, and pointed out the most appropriate treatment, under the articles EYE, GUTTA-SERENA, &c. the reader will consult them accordingly.

SILK-WORM, or *Phalæna Bombyx Mori*, a native of China, where it propagates itself on the mulberry-tree, the leaves of which serve as its only natural food.....

from the labours of this valuable insect, we obtain SILK. The worm is hatched from yellowish eggs, the size of which is rather smaller than that of mustard-seed; and which are laid by a species of white moth, resembling a butterfly.

When the egg is hatched, after being exposed to a warm temperature of from 60 to 70° of FAHRENHEIT, for a few days, a small black worm bursts forth, which is very eager for food, and ought to be supplied with the most tender mulberry-leaves. These will be greedily eaten for about eight days, at which period the worm is seized with a lethargic sleep, for three days; when it changes its skin.... The creature now begins to eat again for five or six days, till it becomes subject to a second sickness or sleep, of a similar duration. A third and fourth stages of equal length succeed, so, that in about 32 or 36 days. the silk-worm attains its full growth, being in this climate from one to two inches, but, in the warmer countries, from three to four inches in length.

After these *four* successive revolutions, the insect devours its food with great avidity for five or six days longer; at the end of which it becomes sickly, and in a manner transparent, when it requires no farther nourishment: at this period, it endeavours to find a convenient spot between the branches, in a dark corner, and begins to *spin*; winding the silk which it draws from its bowels, around its own body, in an egg-shaped, roundish ball, denominated a *cocoon*. In this state, the worm remains for a fortnight, and upwards, inclosed in the centre of its silky habitation, whence it bursts forth in the form of a whitish moth, the wings of which are marked with yellow or brown lines: each female lays from 3 to 500 eggs, within two or three days, when she dies without tasting any food; and the male generally perishes in 24 hours, after having propagated its species....It deserves to be remarked, that, during the first day of its labours, the silk-worm spins only the exterior, irregular texture, which is known, in commerce, under the name of *floret*, or coarse silk, serving for inferior stockings, gloves, &c. On the second or third day, it begins to manufacture fine, connected filaments, extending several hundred yards in length; and, after this useful work, the creature completes its task, by forming its oval solid case, that resembles thin parchment, and in which it rests with safety, till it emerges in the shape of a butter-fly. Those *cocoons*, however, which are intended for the production of silk, ought to be selected within a week, and exposed to a hot oven, in which bread has been previously baked; with a view to prevent the worm from cutting the silk: on the contrary, such as are designed for breeding, ought to be carefully selected, namely, one male to each female: the cocoons of the former being somewhat pointed at one end, while those of the latter are generally of a larger size.

Having thus stated the various changes which silk-worms undergo, we shall proceed to point out the most proper vegetables for their subsistence. The best adapted for this purpose, are the leaves of the black and white MULBERRY-TREE. .....As however, mulberry-leaves cannot always be procured in sufficient quantity, the insects, if

kept in a warm place, may be occasionally fed with those of lettuces. The young, (neither moist nor withered), leaves of blackberries, vines, cowslips, ash, and primroses, have also been advantageously employed for this purpose; and it is asserted that elm-leaves may be safely given to them; though some breeders observe, that such food inevitably causes their destruction.

In the management of silk-worms, *cleanliness* is an object of the first importance: hence, to facilitate the rearing of these profitable creatures, in this climate, the Rev. Mr. SWAYNE has contrived an ingenious apparatus, by means of which, large numbers may be bred in a small compass. It consists of a wooden frame, 4 feet 2 inches in height; each side being 16½ inches wide, and divided into eight partitions, by means of small wooden grooves, into which are introduced sliders, that may thus be drawn in, or out, at pleasure. The upper slider is of paper, and is destined for the reception of the worms, as soon as the eggs are hatched. The two next are formed of cat-gut, the threads of which are about one-tenth of an inch asunder; and are designed for them, when somewhat increased in size. The five lower sliders are constructed of wicker-work, with openings about a quarter of an inch square, through which the dung descends. Beneath all these are placed paper-sliders, to prevent the excrements from falling on those which are beneath them.....For a more detailed account of this contrivance, the reader is referred to the 7th volume of the "*Transactions of the Society for the Encouragement of Arts*," &c. where it is fully described, and illustrated with an engraving.

For the successful rearing of silk-worms, two essential objects ought to be attended to: 1. A sufficient plantation of mulberry-trees; and 2. A proper stock of eggs for hatching, obtained from a climate similar to that in which they are to be bred. Besides, it will be advisable to keep the latter in a *cool*, but not in a cold place, till the tender mulberry-leaves are secured from the effect of night-frosts.... The room in which the insects are managed, should be lofty, dry, and rather dark than too light. In short, they ought to pass through their different stages of life, in an uniformly warm temperature, not exceeding that of summer heat.

The quality of silk greatly depends on the manner, in which the *raw threads* are manufactured. In order to wind them off the *cocoons*, they are immersed into hot-water for a minute or longer, when they are taken out and reeled by means of a machine; the threads are next twisted, and at length woven into ribbons, satins, &c.

The inquisitive reader may consult the 2d, 4th, 5th, and 7th vols. of the "*Transactions of the Society of Arts*," &c. in which the various expedients practised by *silk-cultivators* in England, are fully related. Some practical remarks likewise occur in Mr. BERTEZEN'S "*Thoughts on the different kinds of Food given to Silk-worms*," &c. (8vo. p. 47, 1*s*. Bew, 1789); a treatise worthy of perusal.

[The breeding of silk-worms was much attended to, before the American revolution, in the United States, and from the success which attended the efforts of many individuals in various parts of the

continent from Georgia to Connecticut, it was at first thought that silk would be a profitable article to attend to, but mature reflection has convinced us, that our industry can be more profitably directed to other objects. Those however, who may wish to see the mode of breeding silk-worms may consult the 1st vol. of the *Trans. Amer. Philo. Society*; and for observations on the advantages of the culture of silk, *Carey's American Museum*, and a pamphlet published about 1790 by Mr. ASPINWALL, in Philadelphia.]

SILVER, one of the whitest of the perfect metals, is found in various parts of the globe, both in a native state, and alloyed with other ores.

Silver acquires hardness by hammering, and is therefore (when alloyed with a certain proportion of copper), not only used for coining money, but likewise in the manufacture of spoons, goblets, and other articles of *plate*. Being, however, acted upon, in a peculiar manner, by sulphureous vapours, the surface of silver, if exposed to the air, easily becomes tarnished, and assumes a dark-brown colour. Various powders have, therefore, been contrived, with a view to restore plate to its original lusture; but as most of these compounds are apt to *scratch*, and injure the substance of such expensive utensils, we recommend the following preparation: Take one ounce of red calx of vitriol *(crocus martis)* and two ounces of calcined chalk; let both ingredients be pulverized, and passed through the finest sieve. this composition may be applied, either in a dry state, or, if the silver be unusually tarnished, the powder may previously be moistened with spirit of wine, in order to produce the desired effect with greater expedition.

SILVER-WEED, WILD-TANSEY, or GOOSE-GRASS, *Potentilla, Anserina*, L. a British perennial plant growing on the sides of paths and roads, and in low pastures; flowering in June and July..... GUNNER, observes, that the Scotch and Irish, in times of scarcity, convert the roots of this vegetable into flour and bread. GLEDITSCH recommends the whole herb in the process of tanning calf-leather..... According to Dr. WITHERING, the leaves are mildly astringent: hence when dried and reduced to powder, they have been used with success, in agues. The usual dose is a meat-spoonful every three hours, to be given between the paroxysms. In the winter season, the roots of the Wild Tansey possess the flavour of parsnep.....The plant is eaten by cows, horses, goats and hogs, but refused by sheep.

SIMAROUBA, or *Quassia Simarouba*, L. an exotic tree growing in Guiana, and also in Jamaica, where it attains a considerable height and thickness. Its bark is used in medicine, and is imported in long pieces of a yellowish colour, and a strong bitter taste. Being mildly astringent, it has been advantageously prescribed in doses of half a dram, in the form of a decoction, to be repeated every third or fourth hour, in bloody and other alvine fluxes, and towards the termination of putrid fevers; when it restores the tone of the intestines; allays their spasmodic irritation; promotes the secretions by perspiration and urine; while it disposes the patient to refreshing sleep. It should, however, be remarked, that such medicine would

be highly improper, where an inflammatory disposition prevails, or a suppuration in the bowels is apprehended: nor can it be taken with safety, when the alimentary canal is obstructed. In a state of powder, the Simarouba may be taken in doses from 10 to 20 grains, every three or four hours.

SIMPLER'S JOY: See VERVAIN, the Common.

SIMSON: See GROUNDSEL, the Common.

SINAPISM, signifies un external application, in the form of a soft plaster, or poultice, for the same purposes as a BLISTER, to which we refer.

The most usual sinapism is composed of equal parts of mustard-flower and crumbs of bread, mixed with such a proportion of vinegar as will render it of a proper consistence to be spread on linen, or cotton. In this state, the preparation is to be applied to the skin, till the latter become red and painful. The time required for producing such effect, is very unequal. In irritable persons, it will sometimes operate within 15 minutes; while, in others, it may continue on the part to be stimulated for 6 or 8 hours, without occasioning considerable uneasiness. If, however, the cataplasm be suffered to remain in its place, for some time after the commencement of the pain, it will draw a blister, which must be treated in a manner similar to that occasioned by the Spanish-FLY. But, if it be intended to operate by a gradual discharge of matter, or SERUM, (see BLOOD) the *red* or sore part may be kept in a moist state, by the repeated application of cabbage-leaves; and, according to circumstance, sinapism may be renewed on the same spot.

The *size* of such blistering plasters depends on that of the individual, and the nature of the affection: thus, in children, they need not be larger than one, or at the farthest, two inches in diameter; but, in adults, they may occasionally be spread to the extent of from three to six inches and upwards, though of less breadth in proportion to their length. The most usual parts of the body, on which these external remedies are calculated to produce speedy relief, are the calves of the legs, and the soles of the feet; especially with a view to abate pain arising from internal inflammations; to draw catarrhal and rheumatic humours from parts essential to life, towards the lower extremities; and to determine the morbid matter in the small-pox, so as to affect the face with less severity. In rheumatic tooth and head-achs, the sinapism ought to be applied either to the nape of the neck, or to one of the upper arms; in inflammations of the chest, between the shoulder-blades; in apoplectic cases, to the neck, calves of the legs, and soles of the feet; in malignant putrid or nervous fevers, to the arms, thighs, legs, &c. These *domestic* remedies are, in the instances before enumerated, of greater service than is generally supposed; and we are convinced from experience, that in the plurality of cases, they are infinitely more proper, safe and efficacious, than the common *blisters* of the shops.

SINEW: See TENDON.

SIZE, a viscid preparation, consisting of the shreds and parings of parchment, leather, or vellum,

in water; after which they strained. It is employed by various artizans, but principally by painters and plasterers, who dilute it with a certain portion of water, and lay it on walls, and ceilings, before they are painted, or *white-washed*. Such liquor, however, emits a very disagreeable smell, which continues for several days, till it be perfectly dry: hence, different substitutes have been contrived, the best of which is obtained from *potatoes*.... There are other preparations, known under the names of *gold* and *silver size*, used by carvers and gilders, for applying gold or silver leaf to framework, as well as to various toys; and for burnishing glass. The former may be obtained, by first grinding fine bole on a marble stone, adding a little beef-suet, and triturating the whole together..... Next, some common size is to be dissolved in a double quantity of water, and mixed with the ingredients before mentioned.

Silver-size may be prepared, by grinding small portions of black-lead, and tobacco-pipe-clay (both being previously pulverized), with a little Genoa soap; after which it is duly incorporated with common size.

SKIN, signifies the general covering of animal bodies.

Of all the different integuments, bestowed by nature on organized creatures, that of mankind is doubtless the most admirable: it consists of three strata, each of which has its distinct purpose. The *first*, namely, the *epidermis* or *scarf-skin*, is thin and transparent, being destitute of nerves, as well as blood-vessels; and covering the whole body. This part of the skin is void of sensation; and consists of a series of laminæ or scales, which are increased by pressure and friction, becoming much thicker in one part of the body than in another; for instance, in the hands and feet, which are perfectly callous in persons accustomed to hard labour. It preserves the interior parts from external injury; and, if accidentally peeled off, or destroyed, it is spontaneously renewed.

Between the *scarf* and the *true* skins, there is a *second* coat, termed *rete mucosum*, a mucous membrane, disposed in a net-like form; and which may be dissolved by maceration in water; while the texture of the two former remains unaltered. This membrane substance contains the colour of the different nations of the globe.

The *third* integument is called the *cutis vera*, or true skin, and consists of numerous fibres, which are closely interwoven, so as to form a thick membrane which admits the filaments of the nerves. The surface of this skin abounds with numerous papillæ, or small glands, possessing a most exquisite sensation, and thus forming the sense of Touch, or feeling.

The skin is one of the most important parts of the human frame. On account of its being the seat of exhalation and absorption, it greatly contributes to the healthy state of the system; as it is the general outlet of insensible perspiration. Hence the indispensable necessity of paying strict attention to *cleanliness*; for the contrary conduct will prevent the absorption of the vital particles from the atmosphere, and consequently lay the foundation of various maladies. Thus arise the numerous *eruptions*, which are at

present exceedingly prevalent; but which might easily be avoided, by a due regard to temperance, as well as by frequent bathing, or regularly washing the *surface* of the body.

The human skin, especially that of females, in the temperate climates, is naturally white and delicate; but, as age approaches, its elasticity and activity are, in a great measure, impaired: hence the desire of beautifying and improving "that index of health and years" has become universal. So long, indeed, as this desire does not exceed the limits of moderation, it is highly laudable; but, when the affectation of beauty in a manner absorbs the mental faculties, it becomes a pursuit unworthy of rational agents: nay, the most improper measures are eagerly adopted, with a view to repel or to conceal the approaching symptoms of decrepitude.....Designing perfumers, and empirics, have availed themselves of this "universal passion;" so that they impose their pernicious compounds on the giddy and undiscerning, who seldom see the folly of such practices, till their complexion, constitution, and fortune, are equally exhausted....See also Cosmetics.

SKIN, in commerce, denotes the hide, or pelt, which is stripped off the bodies of animals, in order to be prepared by the tanner, skinner, parchment-maker, or other artisan, and converted into leather, &c.... See Hide.

In February, 1799, a patent was granted to Mr. Joseph Watt, for his improvements in the art of tawing, dressing, and converting, both foreign and English lamb, goat, and other skins, into leather, &c. without using either bran, salt, or lime....It deserves to be remarked that, according to the patentee's statement, skins are dressed, by this new method, in *one-fifth* part of the time required by the former processes. Farther, a considerable saving is made, not only in workmen's wages, but also in the articles of bran, lime, salt, and coal; consequently a less capital is necessary. Lastly, the quality of the skins is thus improved; their colours become brighter; and the gloves manufactured of them, are more durable than such as have been made of skins dressed in the common way.

Another patent we shall notice, is that granted in April, 1799, to Mr. James Knowles; for his invention of a method of dressing or preparing skins, &c.....The principle of this contrivance consists in omitting the old processes of *liming* and *drenching*, by which the quality of the leather is not only injured, but the various operations are retarded...The patentee, therefore, directs the skins to be simply immersed in water, after the hair is removed; when they are to undergo the operation of *fleshing*..... Next, the pelt is again plunged into the water; and, after the necessary *studding*, or *striking*, it is ready to be tanned, tawed, or dressed....See also Tanning.

SKIRRET, the Common, or *Sium sisarum*, L. an exotic plant, which is frequently cultivated in British gardens, on account of its utility for culinary purposes. It is propagated from the seeds obtained in the *second* year, but more advantageously by means of small roots or fibres. The skirret bears great resemblance to parsnep; tho' the former is so tender that it will

...mit of being boiled; for ...eason it is frequently eaten ...ruit, in a raw state: when stewed, however, it forms an excellent ingredient in soups.

The common skirret has an agreeable, aromatic flavour, and abounds with saccharine particles: hence it has been conjectured, that sugar might be advantageously extracted from the root; and M. MARGRAAFF states, that he obtained one ounce and a half of pure sugar from half a pound of this vegetable.....BOHMER observes, that it may more profitably be distilled, and converted into brandy.....In a medicinal view, it possesses diuretic properties, and is in a slight degree stimulant.

SKIRRET, the Broad and Narrow-leaved. See PARSNEP, the Water.

SLATE, a fossil, consisting of a compact stone, that may be split into thin plates.

There are several varieties of this mineral, chiefly distinguished by their colour, which is in general grey, intermixed with blue, green, or black streaks; though sometimes purplish, yellowish, brown, blueish-black; and occasionally, streaked with a darker hue than the ground itself.

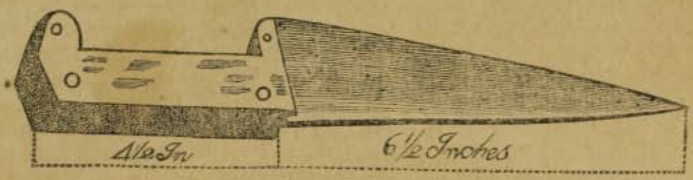
Slate constitutes a part of many mountains: it is found in some counties of Britain, and Ireland, near the surface of the soil: the largest masses of it, however, are dug out in the Island of Eusdale, one of the Hebrides, whence slate is annually exported to England, the West-Indies, &c. to a considerable amount.

The chief purpose to which slates are applied, is that of covering houses; for which it furnishes a strong and elegant roof. As the usual method of *slating* has, from experience, not proved sufficiently durable, Mr. RICHARD ELLIOTT obtained a patent in March, 1781, for a mode of covering houses, &c. on a more safe and eligible plan than that generally followed. His practice consists in cutting the slates in a rhomboidal form, so as to fold over each other. These are next laid in lime or putty, and fastened to the rafters, on boards, by means of nails or screws, either of wood or iron. This patent is now expired; and, as Mr. ELLIOTT's method promises to secure houses covered with this fossil more effectually from the effects of rain and moisture, than the common plan, we recommend the former to the attention of our readers; referring such as may wish for a more distinct idea of his practice, to the 12th vol. of the *Repertory of Arts*; where it is fully described, and illustrated with an engraving.

SLAUGHTERING OF CATTLE, a term used to denote the killing of calves, oxen, or other horned cattle.

The instrument at present generally employed for this purpose, is a common *axe*; by which the animal is at least stunned, in case it does not fall after one or two blows; yet, as the *knocking down* of cattle carries with it an idea of ferocity, a milder and more humane method of terminating their existence, ought to be substituted for that practice. Such desirable object may be attained, by adopting the mode of slaughtering which prevails in Portugal; namely, the "laying down cattle," by separating the spinal marrow with a peculiar knife; in consequence of

which, the animal is *unnerved*, and falls instantaneously: we therefore subjoin the following Cut, representing the instrument employed in that kingdom:



The whole knife here represented, is 11 inches in length; the handle being 4½, and the blade 6½ inches. In order to use it, the person who is about to "lay down" an animal, must place himself in front of the latter, holding it by the horn in the left hand; and passing the knife over its brow, through the vertebræ of the neck, into the spinal marrow....For the knowledge of this practice, we are indebted to the humane Lord SOMERVILLE; who, during his late residence in Portugal, caused a person to be instructed in the use of the knife above delineated. His Lordship has liberally offered to comply with the request of those whose business is to slaughter cattle, and who may be desirous of additional information. He farther observes (in *The System followed during the two last years by the Board of Agriculture, &c.)* that the man alluded to, has *laid* fifteen oxen in a row "with more regularity and expedition than would at first perhaps, be credited."....Lord S. likewise, is of opinion, that if the practice of carters *head-lining*, or walking at the heads of oxen, were adopted in Britain, the animals would probably be induced to stand more quietly; in consequence of which the operation will become "as safe as it is easy."

[It is sincerely to be wished, that the humane method of slaughtering cattle, described by Lord SOMERVILLE, as practised in Portugal, could be rendered general in the United States.

Independently of the superior humanity, evident in the mode, over the ordinary practice; the greater ease with which a bullock would be made to drop, by the new mode, would soon recommend it to butchers, were a few public experiments made.]

SLEEP OF PLANTS, is a certain faculty, peculiar to many herbs, flowers, &c. of assuming, during the night, a position essentially different from that which they bear throughout the day....This change takes place principally towards the approach of night, in leaves and flowers; the appearance of which often varies so considerably, that the same plants can scarcely be recognized. During the night, their leaves are observed to rise or curl up, and sometimes to be pendent, according to the nature and genus of the plant, in order to protect the

, buds, or young stems.... s period of rest is absolutety ecessary to vegetables; their irritability being exhaustsed by the light and warmth of the day. The circulation of the sap, also, is less rapid in their dormant state; from which circumstance Dr. DARWIN conjectures that, as there is less wasted during their inactivity, it is probable that young plants may thrive more rapidly, in the same manner as animals are believed, during their youth, to grow faster when in a state of rest, than in that of exercise.

SLEEPING, is that state of the body, in which the animal functions are suspended.

The proper duration of SLEEP must be regulated, according to the different constitutions and ages of individuals. Thus, in the first six months of its existence, an infant may be allowed to sleep the the greater part of the day; but, after that period, it will be necessary to abridge this indulgence, gradually, with the advance of years. For children, from the age of seven years to that of adolescence, and also for aged persons, *eight* or *nine* hours of nightly rest will be required; but for adults, and those who are not obliged to fatigue themselves with mental or bodily exertions, *six* or *seven* hours will be sufficient.

The proper hour for retiring to sleep, having already been stated under the article BED-TIME, we shall conclude the subject with a few remarks, on the practice occasionally observed in the nursery.

Children, and even infants, are sometimes prevented from going to sleep, by a variety of circumstances, which maternal solicitude only can discover: we conceive it, therefore our duty, to caution parents and conscientious nurses, against employing artificial means, and particularly opiates or narcotic substances, whether externally or internally, with a view to lull the child to sleep; as these detestable remedies tend to stupify the latent faculties, and to weaken the intellect of such tender constitutions. Equally absurd and injudicious is the practice of *terrifying* young people to sleep by threats; or of *wheedling* them by promises; for, in the former case, they early acquire sentiments of disgust and hatred, which have the most baneful influence on their subsequent conduct: in the latter, they become selfish; and, at length, it will be requisite to pay them for sleeping.

SLEEP-WALKING, or SOMNAMBULISM, a remarkable disorder, proceeding from an inflamed or disturbed imagination; and in which the patient's eyes are widely open; though he can discern no object: at the same time, he has the power of recollection; directs his walks to some particular spot; and, after arriving at the end of his nocturnal journey, he retires to bed, apparently composed; and sleeps calmly during the remainder of the night.

Dr. CULLEN considers this affection as an *active* species of the NIGHTMARE (*oneirodynia activa*), and consequently as originating from the same source.

The causes, however, which have generally been supposed to induce *somnambulism*, are: a very plethoric state of the blood, especially that towards the head; a disturbed imagination, in consequence of horrid dreams; or particular

causes that harrass the mind during sleep; and according to LEVADE, contusions of the brain.

Cure:....Where plethora is the cause, the first passages ought to be cleared by a powerful cathartic; and some blood should then be taken, either from the arm or from the foot. Electricity, and frequent bathing, have occasionally proved of service; and it will farther be advisable, to place a vessel of water, or wet cloths, contiguous to the bed-side, so that the patient, by the sudden stimulus on the soles of his feet, be immediately awakened.....Should these remedies fail of success, it has been strongly recommended, by medical writers, to watch the patient, and to chastise him, as often as he is about to renew his noctural rambles; yet we do not approve of such coercive measures.

SLOE-TREE, BLACK-THORN, or SCROGGS, *Prunus spinosa*, L. an indigenous shrub, growing wild in hedges, and woods; flowering in the months of March and April. It generally attains the height of from 10 to 12 feet, and spreads its branches from the root; producing small, round, black-berries in autumn, which possess a very austere taste, till mellowed by frost.

Being of very quick and bushy growth, the sloe-tree is well adapted for hedges and other fences; though it is not calculated for situations where its spreading roots might obstruct the growth of vegetables planted in its vicinity.... The wood is hard and tough; on which account it is usefully converted into walking-sticks, teeth for rakes, and turnery-ware....Dr. WITHERING observes that, from the effects which follow the punctures made by the thorns of this tree, he has reason to believe, they contain some poisonous matter; especially if such wounds be inflicted in autumn.....The young and tender leaves, when dried, afford, in his opinion, the best substitute for the foreign *teas*....If bruised, and infused in currant or raisin-wine, sloes impart a beautiful red colour, and a pleasant rough, sub-acid taste, resembling that of *Port-wine*; a fact too well known to the dealers in that favourite and expensive liquor..... Characters impressed on linen, or woolen cloth, with the juice of the fruit, are said to be permanent. On adding green vitriol to this liquid, the shade is not changed; but, if it be employed for writing on paper, or dyeing linen, and afterwards exposed to the air, an indelible *black* colour will be the result, and which is superior to that obtained from the best galls. ....The dried berries of the black thorn, dye-linen of a *red* hue, which, on repeated washing, changes to a durable *light-blue*.....The bark boiled in ley, also yields a *red* tinge; and, in order to facilitate the decortication of this shrub, it ought to be effected in the spring: ....a decoction of the root, on adding a solution of bismuth, communicates a *cinnamon* shade to wool....The blackish bark is farther, useful for preserving *cheese* from corruption; a fact attested by BECHSTEIN: the same rind, together with the unripe berries, may be advantageously used in tanning.

In a medicinal respect, a handful of the flowers of the sloe-tree, either infused in water, or boiled in milk, and strained, affords a draught which operates as a safe

...e purgative....According ... Withering, the bark, ...en reduced to powder, and administered in doses of two drams each, has cured some species of the ague....An inspissated extract of the same substance forms an excellent *astringent*, which is frequently employed on the Continent, as a substitute for the more expensive, but less efficacious Indian drugs of this description: and it is highly probable, that such preparation might, in many cases, be employed with safety, instead of the Peruvian bark, which is seldom obtained in a genuine state from the shops. The leaves of the sloe-tree, are eaten by horses, sheep, and goats: the bark is relished by hares, deer, and other wild quadrupeds.

Sloe-worm. See Blind-worm.

Sludge. See Sea-sludge.

SLUG, or Naked Snail, *Limax*, L. a genus of insects, comprehending eight species; which differ only in colour; being black, white, reddish, ash-coloured, &c.

These reptiles are destitute of shells, having four feelers placed above the mouth, and which are protruded, or drawn in, at pleasure; they move at a very slow pace; and, from the calmminess of their skin, leave slimy, shining marks, wherever they pass.

Slugs infest gardens and fields, where they do great damage; particularly if the land be stocked with lettuces, cabbages, or turnips. Hence it has been recommended, to strew the ground with lime in the evening, at the rate of fifteen bushels per acre; by which expedient they will be completely destroyed; as they advance from their hiding places during the night, in quest of food. These vermin may also be exterminated, by admitting poultry to the ground infested with them. But, as many husbandmen have not an opportunity of *liming* their fields or gardens; or of keeping a sufficient stock of geese, fowls, ducks, &c. for this purpose, we think it useful to observe, that they may be effectually reduced in number, by the simple expedient of collecting them by the hand, when perambulating the ground very early in the morning, especially during cloudy and damp weather. The destruction of these vermin may, farther, be facilitated by strewing withered leaves, or the putrescent stalks, of cabbages and turnips, on the surface; as they devour the latter with avidity.

One of the most expeditious modes, however, of extirpating slugs, is that communicated by Capt. Shank, to the *Bath and West of England Society*; and which is inserted in the 8th vol. of their *Letters and Papers*. He directs a sufficient quantity of coal-tar to be poured into a barrel, and to fill the vessel with water, which must be suffered to stand for two or three days; when it will become powerfully impregnated; and, if poured on the vermin, will kill them instantaneously. He farther observes that, if such *tar-water* be sprinkled on the land, by means of a watering-pot, both before and after sowing, it will infallibly prevent their depredations.

Slugs, frequently harbour near the foundation of walls, and at the roots of pease, beans, lettuces, &c. where they commit great depredations. Mr. Forsyth, therefore, directs them to be picked off, and thrown into a vessel containing a little unslacked lime, which will

inevitably destroy them: or, the ground infested by these vermin should be watered with a liquid, composed of soap-suds, urine, and a decoction of tobacco.

If slugs be uncommonly numerous on the surface of the ground, particularly in dewy mornings, or after rain, Mr. F. recommends fine unslacked lime to be scattered over the borders of the gardens, thus infested. He prefers, however, the preparation first mentioned; as it not only destroys the insects, but also prevents their increase, by killing their eggs, which are uniformly deposited in the earth.

SMALLAGE. See CELERY.

SMALL-POX is a contagious eruption, attended with inflammatory fever. The recovery should be chiefly entrusted to Nature, while every attention must be paid to diet and regimen. Previous to the appearance of the pustules, the patient should be kept in a cool, but dry apartment, well aired, and abstain from all animal food; though weak broths may be occasionally allowed: on the other hand, he may eat all vegetables of a cooling and mucilaginous kind; boiled and roasted fruit; preparations of pearl-barley, sago, cherries, currents, mulberries, &c.; but cheese, pastry, and confectionary, are very pernicious. The beverage should consist of barley-water acidulated with vinegar or cream of tartar; or one part of milk, mixed with three parts of water, either to be taken lukewarm; but wine, beer, coffee, and tea, ought to be prohibited..... Too great indulgence in sleep is also injurious, particularly on feather-beds, which always increase the heat and fever; it would be more advisable to lie on mattresses, and be lightly covered.....It is a common prejudice of the vulgar, not to shift the linen during the whole complaint; but this change cannot be too strongly inculcated in a disease, where perspiration and eruption render the covering of the skin impure; though great precaution is required, that every new vestment be perfectly aired. If the patient be an adult, and of a plethoric habit, blood-letting may, in this stage, be resorted to, with advantage.

In obstruction of the bowels, none but the mildest laxatives can be given: it would, however, be more advantageous to regulate the body by emollient clysters, each being composed of half a pint of whey, a table-spoonful of honey, two table-spoonfuls of sweet-oil, and a small portion of common salt; such injections to be repeated, till they produce the desired effect. Similar means may be employed with benefit, in cases of convulsions. Where the throat happens to be affected, the most suitable remedies will be warm fermentations applied to the neck, and mustard-poultices to the feet; while the throat should be gargled with vinegar and water.....But, if the patient be of a weak constitution, or be reduced in strength, recourse must be had to corroborants, such as Peruvian bark, taken by the mouth, and injected in clysters; sinapisms, and other stimulents to be devised by the profession. When a looseness threatens to increase this state of debility, small doses of tincture of rhubarb with spear-mint water, in which gum-arabic is dissolved, and the use of the bark, will be the remedies here indicated.

After the eruption has taken place, the fever generally subsides;

in which case it is advisable to abstain from all medicines, and observe the diet above pointed out, unless the pustules disappear again, when blistering-plasters ought to be applied to the calves of the legs without delay, and small doses of camphor taken internally; or parsley-root boiled in milk, frequently eaten, with a view to encourage the eruption: a few drops of laudanum, given in the morning and evening, have often produced that effect, especially where convulsive symptoms were obvious.

If, during the *suppurative stage*, or what is termed the turn of the disorder, the fever be inconsiderable, the same diet will be proper, as was directed at the commencement of the disease; but, should the febrile symptoms re-appear, or the pustules *suddenly* sink [or look flat or pale] (a circumstance which always denotes great danger), blisters must immediately be applied to the extremities; the legs be rubbed with flannel; and the feet bathed in tepid water. [Calomel should also be given in the proportion of three grains every three hours, until the mouth be gently touched; bark, wine, or wine-whey, porter, and nourishing soups must also be given, as the strength of the patient may require.] In this particular situation of the patient, medical advice is indispensably necessary, and ought to be *speedily* procured.

When the scurf begins to peel off, a gentle laxative, twice, or three times a week, will, in general, prevent many of those secondary complaints which frequently succeed the small-pox: or, if the eyes be swollen and inflamed, the application of warm bread and milk with Goulard-water, and leeches to the temples, will, in most cases, remove this local affection. After the inflammatory symptoms have entirely subsided, the patient may gradually resort to his former diet; observing, however, some precaution and moderation in the use of wine, animal food, and other heating substances.

[The above directions are retained in the present edition, for the guidance of those who may have occasion for them, when not near medical aid; but nothing shall be said upon inoculation; as it is high time to cease propagating this loathsome disease, since providence has kindly sent us the Cow-Pock. See Vaccine.]

SMALT, a species of glass of a dark-blue colour; and which, on levigating it, assumes a beautiful shade; resisting the action of air and fire: hence, if it could be rendered sufficiently *fine*, it would prove an excellent substitute for *ultramarine*.

Smalt is prepared, by melting one part of calcined cobalt, with two of pulverized flint, and one of pot-ash. At the bottom of the crucibles, which are employed in manufacturing this compound, there is generally found a regulus of a whitish colour, inclining to red, and rather brittle; this, on being again melted, and becoming cold, separates into two parts; namely, that which settles at the bottom, is the true cobalt, and is used to increase the quantity of smalt; the other is called Bismuth; to which we refer.

Smalt is employed in various branches of the arts and manufactures; as likewise by clear-starchers, in getting up fine linen; and by whom it is termed *powder-blue*.

SMOKE, a dense, elastic fume, which is exhaled from burning coals, wood, and other substances.

Smoke being not only disagreeable to the senses, but also frequently detrimental to health; ingenious men have contrived various means, by which the benefit of fire might be enjoyed, without the inconvenience resulting from such fumigation. Having already stated some of these expedients, under the article CHIMNEY, we shall here add a few other methods, by way of supplement.

1. If the funnel be too short (which is necessarily the case in *low* buildings, as it would otherwise endanger the roof), it will be advisable to contract the opening of the chimney, so as to compel the incumbent air to pass through or at least very near to the fire.... Thus, the funnel will become warmed: and the confined air being rarified by heat, will rise upwards, and maintain a proper draught at the orifice.

2. Another cause of chimnies smoking, arises from the injudicious position of a *door*. Hence, if the door and chimney happen to be on the same side of the room, and the former should open *against* the wall, the air will necessarily pass into the chimney, and expel the smoke into the room. This inconvenience will be felt particularly on shutting the door; the current being then considerably increased, to the great annoyance of those who may be near the fire. Such nuisance may be easily prevented, by placing a skreen from the wall round the fire-place, so as to intercept the air. A more simple method, however, is that of changing the hinges of the door, so that it may open the contrary way; and thus occasion a current of air to circulate along the opposite wall.

Lastly, the chimnies of new houses, for want of sufficient ventilation, frequently smoke to such a degree, as to render them almost uninhabitable. To remedy this unpleasant molestation, it has been proposed to draw down the upper sash of a window, for the space of an inch. As the frames, however, are generally fixed, especially in old houses, an expedient has been adopted, of cutting a circular hole in a pane of glass, and substituting a round plate of tin, suspended on an axis, and divided into vanes; which, being severally bent in an oblique direction, are moved by the current of air; and the ventilator is forced round, in a manner similar to the sails of a windmill. This contrivance generally answers the end proposed; but, as the continual noise is very troublesome the following method has been preferably devised. It simply consists in taking out a pane of glass, and suspending it on hinges, so as to be opened and shut at pleasure; or, the pane may be set in a tin frame, and supported by two moveable joints on each side, serving the purpose of letting it down, or drawing up and shutting it, according to circumstances, having proper hinges at the lower part: thus, by opening such pane to a greater or less distance, the necessary supply of fresh air may be admitted, without exposing persons in the room, to the *draught*. See also FIRE-PLACE.

SMOKING, in domestic economy, is a mode of preserving meat, such as hams, bacon, geese, &c. by previously salting, and then exposing them to the smoke aris-

ing from a wood-fire. For this purpose, the chimney is usually furnished with recesses or *lofts*; which communicating with the funnel itself, in a lateral direction, do not admit a large volume of smoke to pervade the articles there suspended; but, as the latter gradually receive the ascending fumes, they become impregnated with them in a more uniform, and effectual manner. A fire from the branches of the JUNIPER-TREE, imparts to the flesh of animals a very agreeable, pungent flavour.

Smoking of Lamps, is a circumstance frequently disregarded in domestic life: as, however, the fumes ascending from the oil, especially if it be tainted or *rancid*, are highly pernicious, when inhaled into the lungs of asthmatic or other persons liable to complaints of the chest, we shall communicate the following simple expedient: Let a sponge, three or four inches in diameter, be moistened with pure water, and in that state be suspended by a string or wire exactly over the flame of the lamp, at the distance of a few inches: this substance will absorb all the smoke emitted during the evening, or night; when it should be rinsed in warm water, and thus again rendered fit for use.

SMUT, a disease affecting almost every species of corn, the grains of which become filled with a fetid black powder, instead of containing farinaceous matter.

Having already stated in article BARLEY, the result of several experiments, made with a view to prevent this pernicious distemper, we shall now communicate such methods, as are maintained to have proved efficacious; thus rendering our accounts as perfect as the nature of this work will admit.

In the 6th vol. of *Annals of Agriculture*, Mr. ANDREWS recommends the following *steep*, as being preferable to any other; having successfully employed it for several years: Let half a hogshead of strong ley be made, by passing water repeatedly through *wood-ashes*; and be put into a copper with half a pound of *arsenic*. This mixture is next to boil for about five minutes, when the poisonous properties of the arsenic will be so diminished, that birds or fowls may pick up the uncovered grain, after it has been sown, without receiving any injury. The ley should now be poured into a deep vessel, and be suffered to stand till it become cold; when a strong wicker-basket, sufficiently capacious to hold two bushels, is to be set in the liquor, with half a bushel of wheat; which ought to be repeatedly stirred; the light grains, and dusty particles that may rise to the surface, being carefully removed..... The grain is next to be drained, and laid on a brick or clay floor: a sufficient portion of lime should be strewed upon it, in order to prepare it for sowing. This quantity of ley, Mr. ANDREW'S observes, is sufficient for steeping 50 bushels of wheat; and he farther remarks, that only a quarter of a peck of lime will be required for drying four bushels, provided it be mixed the night before it is used.

The *vitriolic acid*, or oil of vitriol, has lately been employed with success, by an enlightened agriculturist, J. S. JENNINGS, Esq. as a preventive of smut. The proportions employed for this purpose, were one gallon of the acid to 30

of water; which form a proper mixture for immersing wheat..... His experiments are of the greatest importance; and we trust that future trials will fully ascertain the efficacy of this process.....See WHEAT.

SNAIL, or *Helix*, L. a genus of testaceous insects, comprising 60 species, of which the following are the most remarkable, viz.

1. The *hortensis*, or common Garden Snail, abounds in this Country. It is covered with a brown shell, and furnished with two horns, containing its organs of sight, which it protrudes, and draws in, at pleasure. This insect is remarkable for the viscous traces which it leaves behind in its course.

2. The *pomatia*, or Red Garden Snail, is found in the warmer parts of Europe, whence it has been introduced into Britain; but, at present, it inhabits principally the southern counties. It differs from the Common Snail in its very deep, brown colour, which approaches to red. This species has, lately been employed in the bleeding piles with uncommon success; fresh insects being laid, in a raw state, on the diseased part, every second or third hour.

Snails are very mischievous in gardens, particularly to wall-fruit; and, though they are preyed upon by numerous insects, such as worms, &c. which breed both in their intestines and on their backs; yet they are in some places so numerous, as to require effectual measures for their extirpation. Hence, it has been recommended to strew the ground with lime and ashes; but the most certain method of destroying them, consists in closing every crevice in walls, as soon as these vermin appear in damp or cloudy weather; and afterwards collecting them by the hand. Thus, in the course of two, or, at the farthest, three years, they will be completely exterminated.

SNAKE, the COMMON, or *Coluber natrix*, L. a native reptile, which is often found in bushy places, and in banks, near waters. It is from two to three, and in the south of Europe, often ten feet in length: the back is of a dusky colour, and the belly is beautifully variegated with black and bluish stripes. It has two rows of small serrated teeth, and is perfectly harmless; being destitute of the canine teeth, with which vipers and other venomous serpents are furnished. It produces numerous eggs, generally dropping them on dunghills, where they are hatched by the warmth of the sun.

The common snake feeds on small insects, frogs, and vegetable substances; thus being of essential service to mankind; as it devours considerable numbers of field and harvest-mice. See SERPENT.

SNAKE-WEED, or *Polygonum*, L. a genus of plants comprehending 33 species, ten of which are natives of Britain: the following are the principal, namely:

1. The *Hydropiper*. See WATER-PEPPER.

2. The *Persicaria*, or SPOTTED SNAKE-WEED, abounds in ditches, and watery situations; though it is sometimes found in corn fields; where it flowers from the month of July to September. This species is slightly acid and astringent: it is eaten by goats, sheep, and horses but refused by hogs and cows.... LINNÆUS informs us, that woollen cloth, previously dipped in a solution of alum, acquires a yellow

colour from a decoction of this plant.....DAMBOURNEY obtained an olive colour. [See POLYGONUM.]

3. The *Bistorta*. See BISTORT the Great.

4. The *vivipárum*. See BISTORT the Small.

5. The *Fagopyrum*. See BUCK-WHEAT.

6. The *Convolvulus*. See BUCK-WHEAT the Climbing.

7. The *aviculare*, or KNOT-GRASS SNAKE-WEED, is found on road-sides, in paths, streets, and corn-fields, particularly in a gravelly soil: it flowers from April to October....This species of grass is eaten by cows, horses, sheep, goats and hogs: its seeds are a grateful food to small birds of every description; and may likewise be employed for the same purposes as those of BUCK-WHEAT, which see: but sheep, feeding on the knot-grass snake-weed, become, according to BECHSTEIN, liable to obstructions, and consequently to putrid diseases.

[SNAKE-ROOT, (VIRGINIA,) or *Aristolochia Serpentaria*; a well known medicinal plant, and a native of the United States exclusively. It has a bitter taste joined with an aromatic acrimony, highly stimulant, and increases the force of the pulse very perceptibly. It is a powerful sudorific, but is improper whenever bleeding is requisite. It is a common remedy in low fevers. Dr. BARTON (collection for a *Mat. Medica*, 2d edit.) says, it was used with great benefit in a malignant fever attended with carbuncles, which prevailed in Bristol, on the Delaware, in this state, in 1749 and 1753. It may be given in infusion, or in powder from a few grains, to 20 or 30. It frequently assists the powers of the Peruvian bark in cure of agues, and of general weakness. It is usually combined with *calamus aromaticus*, infused in spirits or water, and forms the common morning dram in agueish situations. As water fully extracts the virtues of these plants, it should be preferred to spirits, to make these daily medicines.

Another species of *Aristolochia*, (*A. Sipho*) or pipe-vine, is a curious species of Birthwort, and abounds near the town of Pittsburgh, in Pennsylvania. It is a climbing plant, and will rise to the height of 50 feet, attaching itself to trees. The flowers are large, and resemble, in figure, a German tobacco-pipe. The root has a pungent aromatic taste, and for certain purposes, is thought preferable to the first mentioned species.]

SNAP-DRAGON, or *Antirrhinum*, L. a genus of plants, consisting of fifty-three species, eleven of which are indigenous: the following are the principal:

1. The *Elatine*, or Sharp-pointed Toad-flax. See FLUELLIN.

2. The *Linaria*. See Toad-FLAX.

3. The *majus*, or GREATER SNAP-DRAGON, grows on old walls, especially on the chalk-cliffs near Dover and Gravesend, where it flowers in the months of June and July....This herb was formerly in great repute among the superstitious; but, at present, an excellent lamp-oil is expressed from its seeds in Germany.

4. The *Orontium*, CALF'S-SNOUT, or LESSER SNAP-DRAGON, thrives in corn and turnip-fields, and bears purplish flowers covered with a yellow down, in the months of

July and August.....This narcotic, poisonous plant, ought to be carefully extirpated.

SNEEZE-WORT-YARROW, Bastard Pellitory or Goose-tongue, *Achillæa Ptarmica*, L. a native perennial plant, growing in moist meadows and shady places; flowering in July and August....It is eaten by horses, cows, goats, hogs, and sheep:....the roots have a hot pungent taste; the leaves, when dried and pulverized, excite sneezing; and its young tops afford a sharp, though pleasant, ingredient in spring salads.

SNEEZING, a convulsive motion of the muscles of the breast, which is caused by the irritation of the membrane lining the nose; by acrid, pungent matters floating in the air; or by certain drugs denominated *sternutatories* or *errhines*; and in consequence of which, the air is expelled through the nostrils, with a certain loud, hissing report.

This muscular agitation arises, either from external or internal stimulants: in the former case, it is occasioned by the odour of snuff, sweet-marjorum, thyme, &c. inhaled through the nostrils: in the latter, it is induced by the acrimony of the lymph, which moistens the nasal membrane. The matter expelled by sneezing, is derived primarily from the nose and throat; a mucus being continually exuded into those parts from the pituitary integument; and secondarily from the breast and lungs.

Sneezing may be advantageously excited by the use of sternutatories, in certain affections of the head, eyes, &c. or, when foreign bodies have accidentally been introduced into the nostrils of children: such remedies, however, ought to be resorted to with caution; as too frequent a repetition of that convulsive effort, will eventually weaken the sense of smelling, or induce bleedings from the nose.

SNIPE, the Common, or *Scolopax gallinago*, L. a bird of passage, of which there are more than forty varieties, mostly breeding in Europe, and subsisting on insects.... Some of these wild-fowl frequent moors, others delight in swampy bushes, and still others in the open fields. They may be easily taken, by placing in their *haunts*, twigs of birch covered with bird-lime, in various directions: when one of the birds is caught, the sportsman should not be too hasty in removing it; because the creature will feed with the twig beneath its wing, and thus decoy numerous other snipes.

SNOW, a meteor, which is formed by the congelation, or freezing, of vapours in the atmosphere.

Snow differs in no other respect from rain, but that it is frozen in its descent to the earth, and falls in collective masses of transparent whiteness: these are known under the name of *flakes*....It has been erroneously believed, that snow possesses more fertilizing properties than rain; but the real difference has, by Margraaf, been ascertained to be exceedingly small. It serves to defend corn, and all other vegetables, from the severity of winter-frosts; as it prevents the internal heat of the earth from being evolved through the surface of the land, and consequently ameliorates the soil. The plants, being thus sheltered, shoot forth in the spring with renewed vigour; and, being cherished by the genial rays of the sun, vegetate with increased luxuriance.

SNOW-DROP, the COMMON, or FAIR-MAIDS-OF-FEBRUARY, *Galanthus nivalis*, L. a native perennial plant, growing in orchards, meadows; and the sides of hedges; flowering in February and March.

The snow-drop presents a beautiful little flower, and is chiefly esteemed on account of its early appearance; adorning the garden, when the soil is covered with snow: it is divided into three varieties, known under the names of *single*, *semi-double*, and *double*, which differ only in the seasons of their flowering. They may be easily propagated in any soil, and will multiply exceedingly by offsets from the roots.

The roots of the snow-drop may be made subservient to an useful domestic purpose: Dr. DARWIN thinks that, if they were dug up in the winter, and prepared in a similar manner, they might afford a nutritious powder, resembling that of SALEP. He observes, that he once boiled a few; which, on tasting them, possessed no unpleasant flavour. He is therefore of opinion, that, if prolific seeds could be procured from this plant, it might be advantageously cultivated for the same purposes as the ORCHIS; a conjecture which is corroborated by the experiments of GLEDITSCH, who obtained from the roots of the snow-drop an excellent *starch*.

END OF VOLUME FOURTH.

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