APPENDIX 9

RESIDUAL HOUSE SPRAYING

Between

April 15th - July 15th

298	Villages	sprayed
51148	Houses	sprayed
136551	Population	protected

Region I.

[illegible] ZONE - VILLAGES

RESIDUAL SPRAYING

From 1 June To 30 June.

No.	Village	Date	No Structures sprayed	No Population protected	Remarks
1.	[illegible] Panaremmenis	1-6	1	50	
2.	[illegible]	1-6	182	495	
3.	[illegible]	4-6	328	1078	
4.	[illegible]	4-6	45	800	
5.	[illegible]	4-3	176	800	
6.	[illegible]	4-6	245	750	
7.	Agios Nikolaos	6-6	361	1800	
8.	[illegible] Templou	8-6	1	40	
9.	[illegible]	11-6	85	385	
10.	[illegible]	12-6	60	187	
11.	[illegible]	14-6	229	564	
12.	[illegible]	18-6	148	750	
13.	[illegible]	19-6	62	800	
14.	[illegible]	20-6	176	1070	
15.	[illegible]	24-6	55	84	
16.	[illegible]	27-6	104	1020	
17.	[illegible]	28-6	75	375	
	Total.............		2568	11834	

From 1 April To 30 April

No.	Village	Date	No Structures sprayed	No Population protected	Remarks
1.	[illegible] Ierap.	17-4	51		
2.	[illegible]	18-4	25	4880	
3.	[illegible]	19-4	115	454	
4.	[illegible]	24-4	202	434	
5.	[illegible]	30-4	205	875	
6.	[illegible]	30-4	270	1585	
7.	[illegible] Episkopi	30-4	66	270	
8.	[illegible]	30-4	31	155	
9.	[illegible] Pot-mi	30-4	35	175	
	Total...............		976	8616	

SEASONAL SPRAYING

From 1 April To 30 April.

Village	Date	No Structures Sprayed	No Population protected	Remarks
[illegible]	26-4	480	1500	
[illegible]	26-4	290	980	
[illegible]	26-4	95	420	
Total.....		867	2900	

From 1 May To 30 May

[illegible]	6-5	182	780
[illegible]	10-5	76	270
[illegible]	14-5	67	320
Total.....		326	1370

From 1 June To 30 June.

[illegible]	13-6	141	465
Agios Paraskevi	13-6	51	140
[illegible]	13-6	197	450
[illegible]	14-6	114	650
[illegible]	16-6	12	50
[illegible]	16-6	32	150
[illegible]	16-6	70	290
[illegible]	17-6	100	350
[illegible]	17-6	380	1450
[illegible]	18-6	163	550
Agios Dimitrios	18-6	37	150
[illegible]	21-6	30	250
[illegible]	21-6	15	40
[illegible]	22-6	198	980
[illegible]	25-6	100	252
Agios Vasilios	25-6	38	150
Agios Ioannis	25-6	118	350
[illegible]	25-6	170	290
[illegible]	27-6	98	250
Total. . . .		1981	6731

Region I.

RETREATMENT [illegible] - VILLAGES

RESIDUAL SPRAYING

From 1 July To 15 July

No.	Village	Date	No Structures sprayed	No Population protected	Remarks
[illegible]	[illegible]	2-7	120	550	
[illegible]	[illegible]lakori	2-7			
[illegible]	[illegible]	4-7	60	300	
[illegible]	[illegible]gyras	5-7	180	800	
[illegible]	[illegible]	5-7	140	550	
[illegible]	[illegible]	5-7	40	170	
[illegible]	[illegible]	5-7	20	100	
[illegible]	[illegible]	6-7	100	500	
[illegible]	[illegible]	6-7	150	[illegible]	
[illegible]	[illegible]	6-7	150	600	
[illegible]	[illegible]	6-7	80	220	
[illegible]	[illegible]alimi	10-7	180	900	
[illegible]	[illegible]	10-7			
[illegible]	[illegible] Triada	10-7	560	1780	
[illegible]	[illegible]	10-7			
[illegible]	[illegible] Arsaniou	10-7			
[illegible]	[illegible] Assomatou	10-7	1	30	
	Total............		1371	6600	

HERAKLION NOME - VILLAGES

Region I.

RESIDUAL SPRAYING

From 1 [illegible] To 30 April.

Village	Date	No Structures sprayed	No Population protected	Remarks
[illegible]	27-4	[illegible]	[illegible]	
[illegible]	27-4	[illegible]	300	
[illegible]	30-4	153	432	
Total. . .		[illegible]	1407	

From 1 May To 20 May

Village	Date	No Structures sprayed	No Population protected	Remarks
[illegible]	1-5	75	[illegible]	
[illegible]	1-5	[illegible]	[illegible]	
[illegible]	[illegible]	96	720	
[illegible]	6-5	38	[illegible]	
[illegible]	6-5	150	550	
[illegible]	6-5	104	[illegible]	
[illegible]	11-5	[illegible]	[illegible]	
[illegible]	12-5	7	24	
[illegible]	16-5	13	558	
[illegible]	18-5	82	315	
[illegible]	20-5	355	1060	
Total.... .. .		[illegible]	5645	

Region I.

[illegible] VILLAGES

[illegible] SPRAYING

From [illegible] June To [illegible] June.

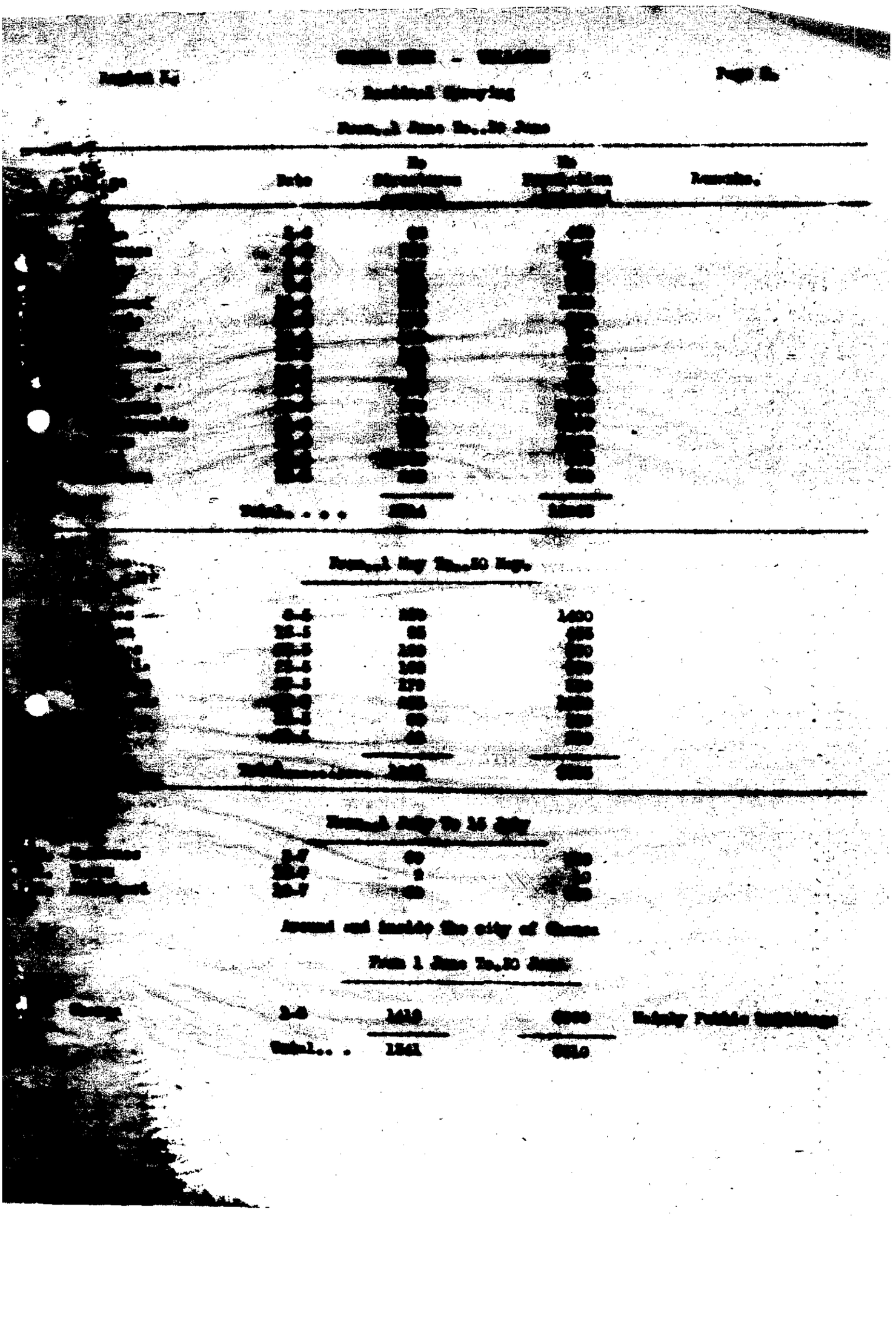
Village	Date	No Structures [illegible]	No Population [illegible]	Remarks
[illegible]	[illegible]	[illegible]	542	
[illegible]	2.6	[illegible]	[illegible]	
[illegible]	[illegible]	250	[illegible]	
[illegible] Mires	[illegible]	[illegible]	1195	
[illegible]	[illegible]	125	[illegible]	
[illegible]	[illegible]	[illegible]	822	
[illegible]	[illegible]	[illegible]	810	
[illegible]	[illegible]	[illegible]	111	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	60	150	
[illegible]	[illegible]	[illegible]	540	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible] Vasilios	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible] ([illegible])	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
	Total [illegible]	[illegible]	[illegible]	

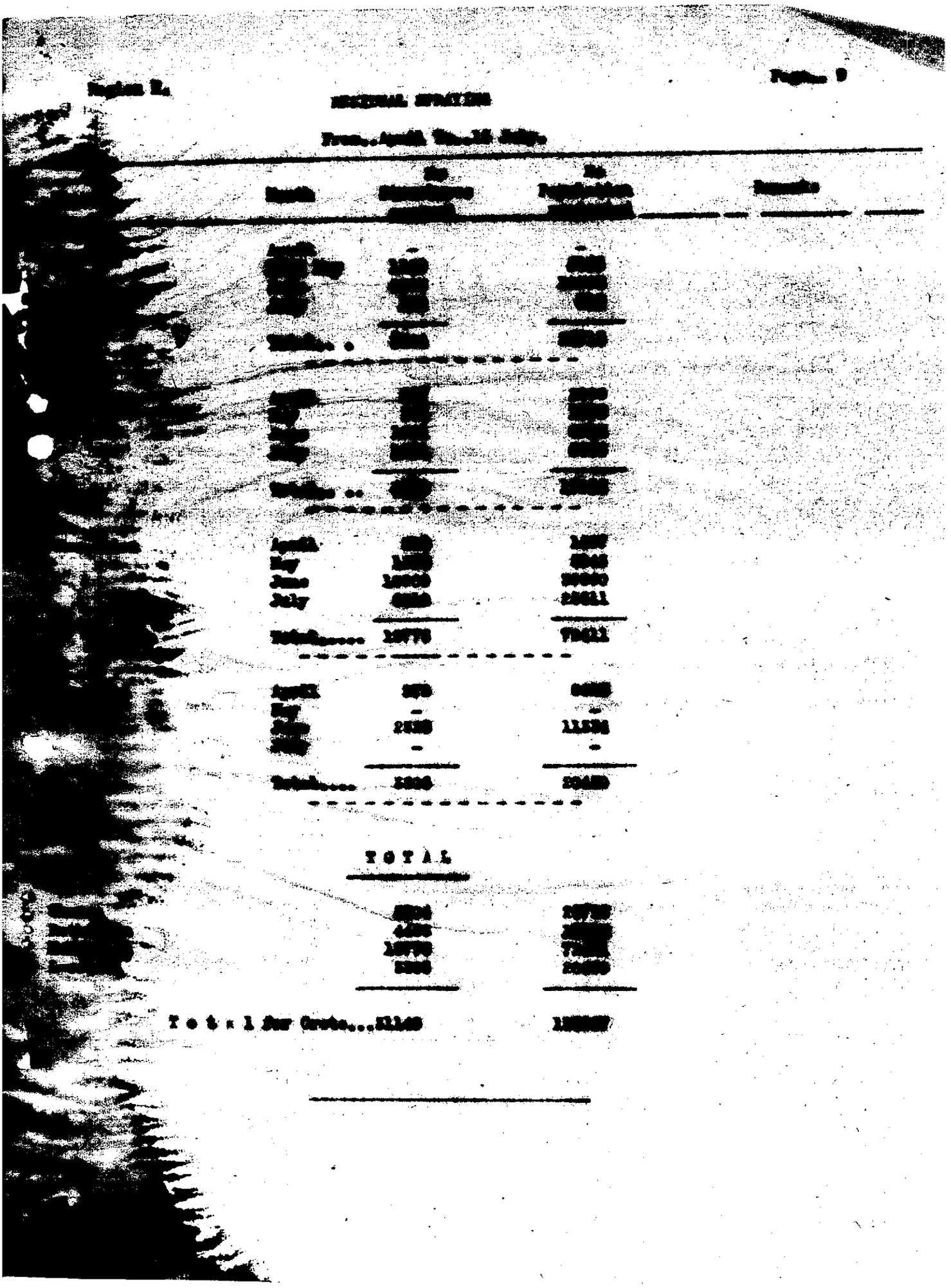
HERAKLEION NOME + VILLAGES

RESIDUAL SPRAYING

Date...1 July To...15 July

No.	Village	Date	No. Structures Sprayed	No. Population Protected	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		Totals	[illegible]	[illegible]	





JUSTIFICATION FOR SANITATION AND
MALARIA ~~SCHEME~~ Control in Greece

The usual order of the above phrase is reversed here. The reason for this is that the Malarial Control Scheme has received so much publicity and its results ~~are~~ so dramatic, that it needs very little in the way of writing up. Nevertheless, a description of what it means and why it should be gone on with may be given here.

For many years, more or less successful attempts to control malaria have been made. The most widely known is of course, the Panama Canal Zone scheme which was as costly as successful. With the means at our disposal and with efficient organisation, malaria and other insect borne diseases have always been susceptible to control, but at an immense expense.

The advent of D.D.T. has made a great change. We now have the most powerful agent ever discovered with which to fight insect pests. Its advantages over the insecticides are many, with three outstanding. First, its long period of activity and its persistance in killing power over weeks and even months. Second, its harmlessness to man in the concentrations used, thirdly, its relative cheapness for the work it does.

For clearing an area, a detailed preliminary survey shows the geographical, climatic and entomological features for the country. The last means the nature and habits of the mosquitoes there, where and when they breed and their density. It also shows the incidence of malaria by areas, by ages, and by types of the disease.

The plan is made and the attack begins. In the winter, hand spraying of houses, stables, sheds, every sheet of building where the adult insects hibernate. This disposes of a large number. In the spring, the survivors emerge from shelters, tree trunks, caves, anywhere, and find water wherein to lay their eggs. Therefore, in the spring and summer, unceasing searches for pools, puddles, any accumulations of water where the easily discovered larvae are active. These waters are sprayed with D.D.T. in an oily solution. And thus it goes on, with occasional re-spraying of houses if insects are found still.

Meanwhile, near the villages lie the ~~[illegible]~~ swamps, both in the plains and in the mountains. The difficulty of covering these by hand and their inaccessibility, together with their size, over 1,000 square kilometres in Greece, make the ordinary methods of spraying impracticable and too costly. Here we use the Aeroplanes. They are small, slow, single engined, two seater, training planes, easy to fly and very safe. They are fitted with special

tanks in the back seat, and a distributing device for spreading the D.D.T. in oil cloud as they fly. They spray up and down the marsh, at a height of about 20 feet or less, using the still hours of the early morning and the evening. One plane can do the work of 6,000 men and can cover with ease 1020 acres in an hour. The marshes, hot beds of malaria, are sprayed three or four times in a season depending on the vegetation. to seven

Now in theory, well substantiated by scientific evidence, it is possible to rid a country of every mosquito in it. That is a cold proposition which is undeniable. Given the support, both financial and social, that could be done. It cannot be done in Greece however, under present conditions which militate against such an operation in the form of Governmental interference with staff for political reasons, opposition on the part of certainnvested interests, e.g. those doctors whose livelihood depends on the treatment of malaria, and the Greek character and its joyous irresponsibility and eternal resistance to discipline and orders, however reasonable, together with faults and breakdowns in supply and it must be said, a degree of sabotage by theft of essentials - oil, machinery, transport.

Therefore, however good the results of 1946 year's work, which we shall be unable to assess accurately until the late Fall when the season is over, it is inevitable that we will not be able to claim 100% clearance of the mosquito. The campaign must be [illegible] year with the same attempt at thorough eradication. If we let up, the mosquitoes who have survived, will soon appear in their millions again, and the money and effort already expended, will be lost.

The reports we have continually received from the sprayed areas, though scientifically valueless, are sufficiently enthusiastic to lead us to the opinion that 1946 was record breaking, not only in the incidence of malaria but in other insect borne diseases as well. The city of Athens was so free of flies this summer that it is a rare thing to see even one. What this means to the children may be guessed at, and [illegible] a fall in the death rate from infantile gastro enteritis. Houses sprayed with D.D.T. for malaria, also remain free of bugs, cockroaches, fleas, and in fact, every insect which helps to make the summer months unbearable. Cattle are in better health and cows give more milk once they are free from the irritation of biting insects.

Can the Greeks get on with this themselves? The answer is 'Yes' to a degree, and 'No' to the degree required. As mentioned above, we have had to fight obstruction influences all the time. Because we are foreign and have the control over the supply of material for this work, we have largely got our way and the work has gone on. If there is no outside control, the scheme will languish, the material, planes and transport will be put to improper use, the frustrating hand of the Government will appear at every move, the supervision we give will be lacking and in fact, the job will never be more than half done, even if it gets that far. We have plenty of evidence of this already. We know of packed payrolls, phantom supervisors, misuse of vehicles for private gain, the firing

[illegible] for inefficient, [illegible] and un- [illegible] routine [illegible] dependant on keep- [illegible].

[illegible] already poured [illegible] this scheme is [illegible] supervision. We [illegible] population [illegible] will be neces- [illegible] be able to cope [illegible].

[illegible] main problems [illegible] disposal of [illegible] war on rats.

[illegible] over the whole [illegible] well known [illegible] preventable [illegible] of hygiene [illegible] that the people [illegible] health nurses [illegible] the immediate [illegible] is not there, but in some form of protection for these people against [illegible]. The simplest and most economical in human lives is to provide them with more or less disease proof water to drink and to establish again simple forms of drainage systems so that the means of living more hygienically are there when they have the will. In any case, without the means, the will cannot carry them very far.

We have programmed an enormous amount of material, pumps, piping, fixtures etc. and much of this remains to arrive after UNRRA has gone. The future disposal of these stocks will be subject to the same conditions of delay, inefficiency, theft, sabotage, as was mentioned in the discussion on the malaria scheme. So we have a similar picture, involving similar conclusions and recommendations.

Our plans and specifications for these engineering jobs, if acted upon, will reduce the costs by very large amounts. It is no exaggeration that under our supervision these jobs will cost less than 50% of what the contractors' will drag out of the helpless villagers, if left a free hand. Political pull will move our supplies from where they are most need d to where some personal or political advantage is to be gained by the interested party. This already goes on and we have to fight it.

There is here a field in preventive medicine which it would be hard to parallel elsewhere. When one thinks of the sums spent on attempting to alleviate

[illegible] diseases, so many of which would never have occurred had some attention been paid to aspects of social life as the above, one is tempted to refer to the [illegible] pound foolish adage. One typhoid infected water supply is capable of [illegible] causing continuing sickness to the tune of thousands of [illegible] annually and recurring annually, money spent in restoring to health [illegible] but a little of the amount wisely spent, would never have contracted the disease at all.

A few words on rat poisoning. Here one feels somewhat more hopeful. The [illegible] '1080' is as potent in its way as D.D.T. is in its way, and has [illegible] possibilities, both in reducing the risk of rat borne disease and in [illegible] the enormous waste of food materials through rat infestation.

We have introduced this poison into Greece and are instructing the Greeks in its use. Its action is so dramatic that we feel that individual Greeks, as well as official bodies, will make good use of it when we are gone. The [illegible] is killing to other animals, dogs and cats, and dangerous to humans, and so must be handled with great care. As its use spreads, there will certainly be a [illegible] of accidents and it is possible that official condemnation of the [illegible] itself. However that is scarcely our affair, but in some degree, [illegible] foreign supervision over its employment until at least a sufficient number of Greek Sanitarians are familiar with it and the risks involved.

III. MATERIAL (90% of the total expenditure)

A. RESIDUAL SPRAYING

100% DDT	kg.	3514	dr.	15,054,000	
80% DDT	"	6561	"	17,714,700	
25% DDT	"	7541	"	20,360,700	
B. Diesel Oil	"	93926	"	35,239,966	94,669,366

B. LARVA CONTROL

a. By hand

100% DDT	kg.	6	dr.	36,000	
80% DDT	"	777	"	2,097,900	
Diesel Oil	"	110	"	45,000	2,178,000

b. By airplane

80% DDT	kg.	1360	"	3,672,000	
Gasoline	gl.	980	"	1,960,000	
L. Oil	"	6	"	48,000	5,688,000
T o t a l			"		102,535,366

IV. LABOR (22% of the total expenditure)

A. RESIDUAL SPRAYING

Foremen and laborers 43		dr. 11,180,000
(Except free labor of villagers)		

B. LARVA-CONTROL

a. By hand

Foremen and laborers 103		dr. 26,780,000

b. By airplane

Personnel	6	" 1,560,000
T o t a l		[illegible]

TOTAL EXPENDITURE

A. **Residual spraying** (75% of the total expenditure)

Material	dr.	94,669,366	
Labor	"	11,180,000	105,849,366

B. **Larva Control** (25% of the total expenditure)

a. **By hand** (60% of the total larva-control expenditure)

Material	dr.	2,179,000	
Labor	"	26,520,000	28,699,000

b. **By airplane** (40% of the total larva-control expenditure)

Material	dr.	5,680,000	
Labor	"	1,560,000	7,240,000
Total			141,788,366
Transport expenses (about 7%)			dr. 10,152,000
General " " 18%)			" 25,046,350
Total expenditure			" 176,986,716

(Except amortization and maintainance of the equipment, transport of the material and equipment to Crete, expenditure for Engineers, Doctors and Central Offices in Athens and the free labor of the communities for residual spraying)

COST PER UNIT

A. Residual Spraying	13,201 houses	
Material	7,160 drs.	per house
Labor	550 "	" "
	8,010 "	" "
Transport (7%)	560 "	" "
General expenses (18%)	1,440 "	" "
T o t a l	10,010 "	" "
B. Larva - Control		
a. By hand	4,000 acres	
Material	550 drs.	per acre
Labor	6,630 "	" "
	7,180 "	" "
Transport (7%)	510 "	" "
General Expenses (18%)	1,280 "	" "
T o t a l	8,970 "	" "
b. By airplane	6400 acres	
Material	670 drs.	per acre
Labor	190 "	" "
	860 "	" "
Transport (7%)	60 "	" "
General expenses (18%)	160 "	" "
T o t a l	1080 "	" "

XIV. [illegible]

1. [illegible] 200,000 [illegible] operation [illegible] months. [illegible] during [illegible] months and [illegible] personnel.

2. [illegible], imported [illegible] Hygiene, [illegible] Malaria [illegible]

3. [illegible] smallest [illegible] the [illegible] of transport- [illegible] larva [illegible] the lack of [illegible]

4. [illegible] Malaria [illegible]

5. [illegible] spraying has [illegible] the Ministry of [illegible] had no effect [illegible]

6. [illegible] DDT air- [illegible] (olive [illegible]) [illegible] results.

Col. Daniel E. Wright '04, chief sanitary engineer, UNRRA, Greek Mission, American Embassy No. 2, APO 512, care Postmaster, New York, N. Y., in addition to directing the carrying out of many emergency sanitary p rojects, water supplies, sewage disposals, etc., is making an effort (the first in history) to attempt the complete control of malaria in entire country which is 87 percent malarious by using airplane sprays and hand sprays with DDT. This program saved an estimated thirty million man-days for Greec e last year and this year will save an est imated ninet y million.

Preliminary Report on the uses of DDT in Greece-1946

Introduction

Greece is the first country in the world to use DDT on a national scale, In 1946 approximately 300 tons will be used throughout the country as:

I) A residual house spray to kill adult mosquitoes, flies, fleas, bedbugs, and lice.

2) A liquid larvicide applied by hand to control small isolated mosquito breeding near villages highly endemic for malaria.

3) A 20% DDT concentrate applied as a thermal aerosol by 10 airplanes which will spray large unexexessible mosquito breeding lakes, swamps, or rice fields.

The entire population of Greece is profuse in their thanks to UNRRA and to Col. D. E. Wright for making this work possible.

Col. Wright spent many years in the Balkans with the Rockefeller Foundation before World War II fighting malaria with the old methods of mosquito control such as oil, Paris Green, and drainage. He learned these methods first in the Panama Canal Zone where he worked with General Gorgas in cleaning up the Malaria and Yellow Fever mosquitoes. These methods have been used effectively all over the world since that time, but the control methods. Col. Wright was the first to recognize the potentialities of D.D.T. and the good work that could be done with it in the Balkan countries. Therefore, because of D.D.T., he joined UNRRA as their Chief Sanitary Engineer, and it has been through his untiring efforts that D.D.T. was introduced and has been used in Greece on a national scale.

The Malaria Service in Greece was organized several years ago by Drs. Balfour, Barber, Shannon and Wright. Some of the best Doctors and Engineers in Greece were trained by these men and they have studied in America on Rockefeller Foundation fellowships.

Gordon E. Smith, San. (R) U.S.P.H.S.
Deputy Chief, Sanitation Section
UNRRA- Greek Mission, August 31, 1946

Surveys

During the past 20 years they have made intensive surveys for mosquitoes and malaria. Malaria is endemic and widespread throughout the country but it is limited to specific and exact spots. These "spots" (coastal swamps, inland lakes, rivers, small streams and rice fields) are well known and change very little from year to year. In 1945 the Greek Government invited the United States Navy Epidemiology Team No. 404 to come to Greece to help with the mosquito and malaria surveys. They have done excellent work and have sampled the entire country. From the records of past and present surveys, the malaria control campaign was started by treating the most malarious sections first.

For administrative purposes UNRRA divided Greece into eleven regions according to natural geographical divisions and in each region placed a Regional Director with a staff of UNRRA personnel who worked in an advisory capacity with their Greek opposites. In each region UNRRA had a Medical Officer and a Sanitary Engineer who worked in close cooperation with the Greek Malariologist and Sanitary Engineer. When sanitation supplies arrived in Athens, they were distributed to all the regions. In the Greek Malaria Campaign, UNRRA personnel did more then furnish supplies and act as advisors, they took an active part in the operations in order to help get the job done.

Plan of operation

It should be pointed out that in Greece, the houses are not scattered all over the country, but are grouped together in small villages. This made D.D.T. house spraying easier.

It was realized that, with the use of D.D.T., the most important work that could be done for malaria control would be to spray all of the houses and other diurnal resting places for mosquitoes in endemic areas. Second in importance would be to search out and treat the many small isolated mosquito breeding spots near villages. When these "spots" are found and properly treated, a little work pays big dividents and goes a long way toward eliminating the disease. (For example, a small spring that supplies water to a mountain village also provides suitable breeding places for Anopheles superpictus in the water that seeps around the edges of stones and rocks in the surface run-off. Malaria, which is carried by mosquitoes coming from such places, could be eliminated by one specially trained man working one or two hours per week with a flit gun loaded with a 5% D.D.T. solution.) However, for hundreds of other villages situated within flight range of mosquitoes (A. elutus and maculipennis) coming from the large swamps, lakes, and rice fields, control by hand method is impossible. In order to do a complete job and cover the entire country 17 Stearman PT. 17 airplanes were procured in America, and equipped by the Tennessee Valley

Authority with the latest device for spraying a 20% D.D.T. concentrate as a thermel aerosol. This method of application gives amazing results in the destruction of mosquito larvae and adults, and large areas can be treated quickly and economically.

Use of airplanes for the distribution of D.D.T.

Ten airplanes were equipped for spraying and seven extra ones were procured for spare parts and for pilot training purposes. One American pilot-instructor and one mechanic were hired to train Greek pilots how to fly and maintain these special planes for killing mosquitoes. Two Greek pilots and one mechanic came to America for a short period of training where they studied malaria control methods in the T.V.A. In Greece 15 additional young R.H.A.F. pilots and 30 mechanics were selected for training as mosquito pilots and maintainance men.

The pilot training program started in Greece around the first of the year. While this was in progress, surveys were made of the airdromes. Tents were sent to Crete, Argos, Lamia, Ioannina, Agrinion to serve as storage space for gasoline, D.D.T. and guards quarters. The other airdromes at Kalamata, Araxos, Larissa, Salonica, Kavalla and Athens had permanent structures on the fields which could be converted to suit our needs.

After completing the preliminary training on the Elefsis Airdrome near Athens, the planes and pilots were assigned to the regions, where the areas to be sprayed were surveyed from the air by the pilot and his instructor. Later the Regional Engineer and Malariologist made reconniassance flights with the pilot to show him exactly where they wanted him to spray. Then the malaria inspectors would take the pilots into the field where dips were made for mosquito larvae until the pilot knew exactly where to look for mosquito breeding. This completed his training. They started spraying the swamps on May 1st according to flight orders and instructions issued to them by the Regional Sanitary Engineer and Malariologist. Planes, each with one pilot and two mechanics, were b ased at Iraklion, Kalamata, Araxos, Agrinion, Ioannina, Larissa, Kozani, Salonica, Kalamata, Araxos, Agrinion, Ioannina, Larissa, Kozani, Salonica, Kavalla and Athens. Other auxilliary operational fields were used in each region. With this distribution it has been possible to reach all the mosquito breeding swamps in Greece. Due to lack of transportation and bad roads, it has been difficult for the malaria inspectors to keep up with the work of the airplanes, which have been able to go places and to work quickly.

By using some of the spare planes for inspection trips, it has been possible to keep in close contact with the men in the regions and to observe the results. The pilots are a very eager enthusiastic group of boys who

have taken a great interest and pride in their work. Since the planes have been in Greece the total hours foown up until August 1st was 1653, including training and reconniassance flights. Approximately 285,440 acres of mosquito breeding surface has been treated with 17,840 gallong of 20% D.D.T.

Accidents

To date we have had 14 accidents and to say that we have been lucky is an understatement. While training, one pilot hit a sea wall and crashed resulting in his death and a total loss of the aircraft. The other 13 accidents and forced landings did not injure the pilots in anyway and only caused minor damage to the aircrafts. One had to be brought down out of the mountains by male pack. Eight of the accidents were due to pilot error, six were due to motor failure. The mechanics and ground crews deserve a lot of credit for repairing the planes and getting them all in the air again with minimun delay.

Observations of results

When the fall surveys are made this year we will have accurate scientific information about the success of our malaria control efforts. However, it will take more than one year to realize the full benefits from the work that has been done. In spite of many difficulties, lack of transportation, shortage of supplies, and political sabotage, the entire country has been covered, and a good job of malaria control has been achieved. The people of Greece are enthusiastic and grateful for the "miracle" that has been done to rid them of flies, fleas, bedbugs, lice and mosquitoes, On Crete 2000 people were treated for scab ies with a 5% solution of D.D.T. in kerosene. They were completely cured with one application and have suffered no ill effects from the treatment.

The Minister of Agriculture has used considerable quantities of D.D.T. for experimental purposes. The results indicate that in the future, more D.D.T. will be used to control agricultural pests than will be needed to control insects of medical importance. Olive trees were sprayed by airplane for Dacus fly control. The results were reported to be good. On some of the lakes the pilots made repeated applications of D.D.T. which resulted in the death of frogs and some of the top feeding fish. However, on the great fishing lake at Ioannina where accurate observations could be made, all of the mosquitoes disappeared after 4 thermal aerosol treatments (at the rate of 0.1 pound D.D.T. per acre), and not a single fish was killed. Silk worms were killed when the houses near their breeding places were sprayed with D.D.T. or when they were brought into the houses after spraying. D.D.T. aerial spraying has not caused any apparent damage to the honey bees of the country.

To date very few cases of malaria have been reported in Greece. Our files are bulging with letters of thanks and appreciation for the work that has been done from village presidents and high officials of the country. The army airbase at Araxos is reputed to be the worse base in Greece for mosquitoes and malaria. In the past, the large swamps around it have been impossible to control by hand methods. This year, however, the airplane has controlled mosquitoes breeding in these swamps with little difficulty and no one has had malaria.

In July and August most of the swamps dried up 50% amd made the task of spraying all, of them easier. After 4 or 5 D.D.T. treatments mosquitoes are difficult to find. Although good work has been done it is only a beginning. Many problems have been overcome which will make the work easier in the future. If the work that has been started is continued for two more years. the results will be very interesting. Indeed, the Greek people will be relieved from a scourage that has plagued them for many centuries.

Summary

D.D.T. is being used in Greece on a national scale for malaria control. To date approximately 300,000 houses, stables and other diurnal resting places for mosquitoes have been sprayed with D.D.T. Mosquito breeding places are being systematically treated by hand and by airplanes. The result of this operation has met with very enthusiastic approval, from all the people. The flies, fleas, bedbugs, and lice have been killed as well as mosquitoes.

It is apparent that the work to date has been successful, but it is only a beginning and should be continued until the job of eradicating malaria from the country is complete.

Memo to Dr. CHISHOLM :

Attached you will find my old Passport with the request that a new one be issued for my assignment to Greece.

If possible it is requested that a Diplomatic Passport be issued as it will very materialy facilitate my work, and the visits to other countries that it will no doubt be called upon to make.

Visas should be obtained for the following countries :

GREECE	ITALY	YUGOSLAVIA
LEBANON	SYRIA	EGYPT
TURKEY	ENGLAND	FRANCE
SWITZERLAND.		

For the information of the Passport Section of U.N. I might state that there should be on file in Passport Section of the State Department, W.D.C. a request for a new Passport that was made out in Greece and forwarded from there, but my departure from Greece for the U.S. prevented my having it sent there.

D. E. WRIGHT.

UNRRA - [illegible]
SANITATION SECTION

MALARIA CONTROL 1946

LARVA CONTROL

AIR SPRAYING BY AIRPLANE

I. The swamps of Greece

- Total swamp surface (estimated)	250,000	acres
- Total swamp surface to be sprayed by airplane		
1) Max. (45%)	113,000	"
2) Min. (32%)	80,000	"
3) Average (38%)	96,900	"

II. Larva Control Period

- From 15 April to 15 Oct. about 180 days

III. The airplanes

- Airplane procured		18
- Airplane lost in accident during pilot's training		1
- Airplanes actually used during the control period		
1. To perform 45 working months	7	
2. Inspection etc.	1	
3. In permanent repair	1	9

IV. The airplane personnel

1. Pilots
   Imported by UNRRA
   Greeks : 2 trained in U.S.A. — 1
   14 " " Greece — 16

2. Mechanics
   Imported by UNRRA
   Greeks : 1 trained in U.S.A. — 1
   31 " " Greece — 32

3. Watchmen and laborers — 30

V. Airplane work

1. Flying time

For training hrs.	400
" testing etc. hrs.	150
" inspection "	356
" spraying	1938
T o t a l hrs.	2844
Actual spraying time hrs	578

(Note: To spray 1000 acres it is needed 4,80 hrs. total flying time, except training time, with 1,14 hrs. actual spraying flying time.)

2. Swamp spraying

April	acres	12,860
May	"	69,789
June	"	80,532
July	"	92,620
August	"	97,780
September	"	124,486
October	"	25,686
T o t a l	acres	503,753

Average Number of sprayings 5,3
Surface sprayed per working months acres 11,259

VI. Total material consumed for larva control

1. Gasoline

For spraying	gal.	27,288	
" testing, inspect.	"	7,800	34,488

2. L. Oil

For spraying	gal.	675	
" testing, inspect.	"	177	852

3. 20% DDT in Velsicol 26,917

VII. Material consumed per 1000 acres of sprayed surface

1.	Gasoline	gal.	67.5
2.	L. Oil	"	1.7
3.	20% DDT	"	57.5

VIII. Material consumed per one flying hour

1.	Gasoline	gall.	14.80
2.	L. Oil	"	0.35

IX. Labor consumed for larva control

1.	Pilots and mechanics,	man days	7300
2.	Watchmen and laborers,	" "	5700

X. Labor consumed per 1000 acres of sprayed surface

1.	Pilots and mechanics	man days	14.4
2.	Watchmen and laborers	" "	11.3

XI. Labor consumed per one flying hour

1.	Pilots and mechanics	man days	3
2.	Watchmen and laborers	" "	2.37

XII. Total expenditure for larva control in dreams

1. Material

Gasoline	gal.	34,428 X 1800 =	61,970,400	
L. Oil	"	692 X 8000 =	5,536,000	
20% DDT	"	28,917 X 7000 =	202,383,000	270,895,400

2. Labor

Pilots, mechanics				
man days..	7300	X 15000=	109,500,000	
Watchmen, laborers				
man days..	5700	X 5000=	28,500,000	138,000,000
T o t a l				[illegible]
or				[illegible]

XIII. Cost per acre of sprayed surface

1. Material

Gasoline	122.
L. Oil	13.5
20% DDT	[illegible] 53.5

2. Labor

Pilots & mechanics	226.
Watchmen & laborers	56.3 [illegible]
T o t a l	[illegible]
or	$ [illegible]
Total cost for 5.3 sprayings	[illegible]
or	$ [illegible]

UNRRA
SANITATION SECTION

REGION "K" GREECE

MALARIA CONTROL

SEPTEMBER 1946

I. GENERAL EXPENSES (14% of the total expenditure)

Office Employees	20	dr.	5,200,000	
Homes Inspectors Employees	4	"	520,000	
Province Employees	18	"	4,680,000	
Storehouses, laboratory Employees	24	"	6,240,000	16,640,000
Rents		"	528,000	
Stationery		"	1,807,400	
Lighting		"	1,197,500	
Efferent Expenses		"	4,875,420	6,404,320
T o t a l		"		23,044,320

II. TRANSPORT (6% of the total expenditure)

Drivers etc.	17	dr.	4,420,000	
Gasoline gl.	2267	"	4,532,000	
L. Oil gl.	150	"	1,200,000	10,152,000
T o t a l				10,152,000

THE PROGRAM OF INSECT CONTROL ON CRETE

Crete represents a very unique problem from the standpoint of mosquito control, due to its geographical location. The island is sufficiently far from the mainland to insure nocchance of reinfestation by flight of mosquitoes, and the danger from ships and other carriers can be controlled, if modern methods are applied. It was due to these conditions that it was decided to attempt, not a specie control of mosquitoes for malaria alone, but a campaign of eradication of all species of mosquitoes on the Island, and at the same time control if not eradicate other insects, such as flies, bed bugs, fleas, sand flies, cock roaches and ants in the houses and other buildings on the island by using the new wonder drug DDT by the latest and most improved manner used by the U.S. Army and the National Research Board in its various research branches in the U.S.

To undertake the above required a large and well trained personnel, as well as large quantities of material, equipment and transportation. It was realised also that to carry out this program in as intensive and extensive a manner as planned would require more money than in fairness to the rest of the country could be spent from the appropriation made by the Government for labor. After careful study of what the program would cost, an appeal was made to the Greek War Relief for a sum of money that would make it possible to do the work and at the same time in no way discriminate against the rest of the country, on a population basis. The sum requested of the Greek War Relief was granted, and our organization carefully planned. The Island was divided into four sections, each in charge of an Engineer, and each Section in turn divided into fifteen mile strips, making it possible for one man to cover this area thoroughly at least once a week for larva control. Classes were held for the purpose of instructing likely young men in the proper method of residual spray work for all kinds of insects as well as mosquitoes. Tests were given and those showing the most initiative and making the best grades were employed as Inspectors. These men were assigned to the different Sections, and in turn sent to villages to supervise the spraying of all houses, stables and outbuildings by labor furnished by the villages at no cost to the Government. This plan met with an enthusiastic reception throughout the country, our only difficulty being to persuade the different villages to wait their turn, as the work was started based on a very careful survey made by the U.S. Navy Malariologist te team, that gave us an index of the villages where malaria was found and the extent. It was hard to convince the people of a village where flies, bed bugs, lice and other insects were plentiful, but no malaria, that they should wait until the malarious villages were sprayed, but this rule had to be enforced for the good of the whole program.

We placed one of our very best Engineers in charge of this work, who is a Greek graduate of two of our best Universities in America, from one of which he received his B.S. degree and from the other his Master's degree. It was our plan to have him organize and handle the purely Engineering task of eliminating mosquitoes and other insects, while the results of his work would be checked by a Malariologist of the Malaria Control Section of the Ministry of Health. The work was started with enthusiasm by all concerned, and by none more so than the people of the Island, but the fact that the work was progressing so satisfactorily and successfully was more than the Malariologist could stand, for although he does not have the ability to organize a job of the magnitude involved, and his knowledge of the use of DDT in its various forms almost non-existent, he proceeded to sabotage the work by starting rumors that the men employed on the work were not loyal to the Government and were spreading propaganda. He did not make charges of incompetency, as he is not capable of judging the competent from the incompetent. Charges were made to various Deputies on the Island, to his immediate Chief in Athens, and indirectly to the Minister of Health. The result of this campaign, so carefully worked out, was that the Minister of Health issued an order to the effect that no money appropriated by the Ministry could be spent under the supervision of UNRRA Engineers and that no employees could be used on the job until they had been screened by the Ministry or his authorized representative, regardless of efficiency. This, needless to say, made the situation impossible for UNRRA and the Regional Director ordered all UNRRA support to the program withdrawn, bringing this all important program for the people of Crete to a standstill. That politics and deliberate sabotage on the part of one man and a few of his friends could bring about such a loss to over four hundred thousand people is almost unbelievable and it most assuredly could not happen in any other country than Greece.

It is feared by many that the sabotaging of the Crete job is only the beginning of a well formed plan to destroy the entire insect control program that is so well under way throughout the country. Every day instructions are being issued to discharge qualified and well trained Inspectors and laborers, and have them replaced by untrained men. This can result in but one thing and that is a waste of valuable material and ineffective work.

Greece to-day is closer to having malaria under complete control than at any time in its history, and only one that knows the real condition brought about by the curse of this disease can appreciate what it means. It is surprising that politicians, who as a rule justify any means to an end, would not hesitate before they would destroy a program that would prevent a million or more people from being laid up with malaria out of a population of a little

over seven million, with the terrific loss in man days of labor, not to mention the cost of medical care and death.

After six weks' loss of time in just about the middle of the malaria season, work was resumed on the Island, but it was simply impossible to make up for the lost time, and our hope for a complete mosquito eradication job for this year was abandoned, but not the fight to control malaria. Fortunately, from a malaria standpoint, the surveys made by the U.S. Navy malaria team early in the spring gave us definite information of the extent of malaria on the island and in what villages and towns it was most prevalent, which made it possible to systematically handle the malaria villages first. The psychological effect on the people was greater, due to the general clean-up of their houses, freeing them of flies, bed bugs, lice, fleas, sand flies and other insects than from mosquitoes, but since they were included in the clean-up, they were all the more enthusiastic, and when the work was stopped, due to political pressure, there was a threatened revolution, and justly so, as only in a country like Greece would such an order have been given. In the end the Chief of Mission agreed to replace one of the best Engineers in UNRRA service (a Greek) on condition that the Doctor responsible for the trouble be replaced. Work was resumed on Sept. 15 and has continued to date without friction, as an intelligent Doctor looking after the malaria end of the work and an Engineer in charge of the insect control and general sanitation were appointed, much to the general satisfaction of the people of Crete. This is one piece of work in which it is safe to say the contribution of the Greek War Relief has returned large dividends and has received the highest praise. It is unfortunate that it was not possible to accomplish our original aim of ridding the Island of mosquitoes, which is entirely feasible, and it is hoped will be carried out next year with a comparatively small cost for material and labor. I am sure it would be a pleasure for anyone contributing to this project to see results obtained and the general satisfaction of the people.

Many valuable and badly needed sanitary projects were carried out on the Island, such as repairs to and installation of water lines, repairs to reservoirs, installation of latrines, public baths, and disposal of garbage. Flies were kept under complete control, which in itself reduced diarrhea, dysentery, other intestinal diseases and trachoma, no small public health menaces. UNRRA can justly say it did a good job on the Island of Crete, and one that will be long remembered by the people.

One (1) M/S 500 tons of general cargo, being built specially for cargo boat and not being built as a passanger ship and after being converted in cargo ship.

All iron plates nailed and NOT welded.

Proportion accommodation for the crew.

On good conditions and ready for sail after Lloyd's Revision.

Propulsion Intsaliation: 2 Diesel machines, (few turning 250-300) 150 H.P.abaout each, gas-oil, with two propellers, or if with 2 diesel machines is missing, then with one Machine Diesel, (few turning 250-300) gas-oil, with one propeller. 300 H.P.

Other Diesel machine, 30 H.P.with generator, Dynamo and compressor, gas oil for the operation of derriks, and leighting

Winches: 2 derriks, capacity of each 1½ ton easyly.

Holds: With two (2) holds

Speed: being loaded 9-10 miles.

Insurance: Being accepted from the American and English Lloyd for Assurance and on usual prime.

Flag: Being permitted to change flag from American to Greek Flag.

Delivery: In the harbour of Piraeus or other ports of East Mediterranean.

Payment: Same as per liberty ships, that is 25% immediately in cash balance of 75% in ten yearly payments.

Irakl'ion - Crete - Greece
28.9.48

Suggested Budget for U.S. Educational Foundation in Greece, 1948-49.

Athens College. Enrollment 793 (140 boarders).

3 teachers of English and English Literature at $2500	$ 7,500
10 boarding scholarships at $1100	11,000
40 tuition " at $250	10,000
	$28,500

Pierce College. Enrollment 550 (16 boarders).

2 teachers of English at $2000	$ 4,000
1 teacher of History	2,000
3 boarding scholarships at $1000	3,000
40 tuition " at $200	8,000
	$17,000

Anatolia College. Enrollment ca. 500

1 Professor of English	$ 4,000
1 " " to head adult education program	4,000
1 instructor of Mathematics	2,000
1 " " elementary Science	2,000
40 tuition scholarships at $200	8,000
5 boarding scholarships at $1000	5,000
	$25,000

American Farm School. Enrollment 200

1 teacher	$ 5,000
scholarships	10,000
	$15,000

Athens University.

1 Professor	$10,000

Salonica University.

1 Professor	$10,000

Hydrobiological Institute.

1 Specialist	$10,000

Carried forward	$115,500
American School of Classical Studies.	
4 fellowships at $4,000	$ 16,000
3 " at $2,000	6,000
1 " at $1,500	1,500
	$ 23,500
Travel Grants.	$ 10,000
Vocational training specialist teacher for proposed secretarial school in Salonica	$ 10,000
	$ 5,000
Administration.	$ 20,000
Unassigned Funds.	$ 6,000
TOTAL	$190,000

I n f a c t For the Millions Who Want a Free Press

(No. 128) Vol. VI, No. 24 March 22, 1943 George Seldes, Editor

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MOVE TO RID AMERICAN LEGION OF FASCISTS

An important movement is now under way to take the American Legion out of the control of the bankers, corporations, corporation lawyers, big business men and native Fascists who have controlled it ever since it was started.

If any reader is unaware of the fact that the Legion was organized by special moneyed interests, and that it has been in Fascist hands a large part of its existence, the fault is with the daily newspapers, which have suppressed the facts. The facts are:

1. In order to keep American soldiers from getting what was promised them in the World War, namely, a "Land Fit for Heroes," and to check what was termed "radical" thought for a better world, certain officers aided by a big fund raised by corporations, founded the Legion.

2. Almost all Legion commanders have been corporation men.

3. More than one Legion commander has come out for Fascism.

4. The Legion was the greatest unofficial force to smash the labor movement; it was the greatest strikebreaking force in America until recently.

5. The Legion announced its policy of 100% Americanism; it denounced all other Isms, but it never in its entire history published one word against Fascism.

6. Year after year, from its beginning, the Legion was listed as No 1 enemy of civil liberties in the annual report of the American Civil Liberties Union, and documentary evidence was published to prove this charge.

7. The Legion was found to be an undemocratic force and its control by a handful of politicians and corporation lawyers also found to be undemocratic.

8. When one liberal post of the Legion published a pamphlet in favor of real democratic Americanism, the Legion moved to suppress it.

9. Only 1,000,000 of 4,000,000 men entitled to belong have ever been members. Legion statistics show it is composed of wealthier element, and few workingmen.

10. Today, while Commander Roane Waring, aided by the Hearst press, smears labor, a movement has started among union men in the Legion for knocking out native Fascist control. A large part of this issue of IN FACT is devoted to this constructive work.

(Documentation: Congressional Committee report, "Nazi and other Propaganda," 1935; "The American Legion as Education," by Prof Wm Gellerman, Columbia University; "King Legion," by Marcus Duffield; "The Truth About the American Legion," by Arthur Warner, The Nation, vol 113. Gellerman has collected undisputable evidence, naming the persons who started the Legion, the money contributed to keep it going, and has listed the bankers, business executives and corporation lawyers who have run the Legion. This book is sponsored by Teachers College, Columbia U. It has the evidence on all points not mentioned here for lack of space.)

Anyone who looks into the origin of the American Legion will find that it was organized by the agents of big business and profits for the purpose of destroying the great American idealism of the Army in France. We really believed in making the world safe for democracy. All of us who were in the Army of Occupation believed that Wilson would win through and that even Lloyd George and the others would live up to the wartime promises, which were:

"A New World."--Lloyd George (Note: Wallace's Century of the Comman Man of today.)

"A New Deal for Everybody."--Lloyd George. (Note FDR'S New Deal, a generation later.)

Big Money Started Legion

"Industrial Democracy."--Wilson. (Note that most of Congress today is trying to smash the few gains labor has made, rather than enlarge industrial democracy.)

"A Land Fit for Heroes."--promised by several prime ministers, king and presidents on the winning side.

"End of the Conflict Between Capital and Labor; Workingmen's Cooperation in Industry."--promised by Giolitti to the workmen of Italy and by Charles M Schwab of Bethlehem Steel, spokesman for U S industry.

Gellerman gives all the evidence which he and other researchers have dug up on the reasons the Legion was started by such men as Ralph Cole, Eric Wood, Franklin D'Olier, Col Bill Donovan, Theodore Roosevelt Jr, Major (now Congressman) Ham Fish, and Captain Ogden Mills, the multi-millionaire who was later Sec'y of the Treasury. This is his summary:

"The American Legion was in no sense a 'spontaneous expression...of Americans who helped crush autocracy.' On the contrary, it is evident that it was intended to circumvent any spontaneous organization on the part of ex-service men. ...The morale of the American army after the armistice was unsatisfactory... Those responsible for the initiation of the American Legion have been satisfied with the results..It not only met the threat of Bolshevism at the end of the World War but has been a satisfactory antidote to 'radicalism' throughout the

entire postwar period and promises to be so for a number of years yet to come.

"It required a quarter of a million dollars to finance the American Legion during its organization period. This money was borrowed...but it seemed expedient to make it appear that the money came exclusively from Legion members. No one has yet satisfactorily explained the letter on Swift & Co stationery...." This letter stated that the meat packers were to raise their quota of $100,000 for Illinois; James B Forgan of First Nat'l Bank was treasurer. The letter, dated Dec 26 1919, stated:

"To Offset Radicalism"

"We are interested in the Legion, the results it will obtain, and the ultimate effect in helping to offset radicalism."

Radicalism then, as under the Martin Dies dictatorship, means everything aiding the majority of Americans, from public ownership of utilities, to a living wage in industry.

Gellerman's book concludes: "The American Legion is a potential force in the direction of fascism in the U S....In the American Legion program of suppression [of free speech, labor rights, minorities, books, public assembly, strikes, etc., all detailed previously] we see fascism in its incipient states. The American Legion is irritated by those movements in American society which seem to threaten the status quo."

The first commander of the Legion, Clark, was a lawyer and director of corporations. Others: Foreman, lawyer and wholesale hats; Lindsley, banking, insurance, Wall St personage; D'Olier, Prudential Insurance, Chase National Bank, etc; Galbraith, corporation treasurer; Emery, Detroit banker; MacNider, Iowa banker, corporation president; Owsley, lawyer; Quinn, Los Angeles banker; Drain, lawyer, Spokane banker; McQuigg, East Cleveland banker; Savage, manager—(etc.))

No wage earner has ever held an important office. About 90% of the men who went to the war were wage earners, but the corporation lawyers and corporation heads always succeeded in running Legion politics and getting the offices.

The Legion's Fascist Record

One of the first commanders of the Legion was Alvin Owsley, of Texas, and the 36th Division. He was elected at the San Francisco convention, which went on record by sending an invitation to Mussolini to make the principle address. Learning of the pro-Fascist tendency of the Legion and its new commander, the NEA Service (Cleveland syndicate operated by the Scripps-Howard press) had one of its star men, Edward Thierry, interview Commander Owsley. This copyright interview was released Dec 9 1922 and was published throughout the country that and following days. Here is the main part:

> "If ever needed, the American Legion stands ready to protect our country's institutions and ideals as the Fascisti dealt with the destructionists who menaced Italy!"
> —Colonel Alvin Owsley, commander of the American Legion, made this statement in an exclusive interview with NEA service today.

"By taking over the government?" he was asked.

"Exactly that." declared Owsley. "The American Legion is fighting every element that threatens our democratic government--Soviets, anarchists, IWW's, revolutionary socialists and every other 'red'.

"Should the day ever come when they menace the freedom of our representative government, the Legion would not hesitate to take things into its own hands--to fight the 'reds' as the Fascisti of Italy fought them."

The Legion commander said the world spread of revolutionary doctrine had to be taken seriously. He said patriotic Italians had been forced to take extreme measures which probably would never be necessary here. But he emphasised the significance of what the Fascisti had done.

"Do not forget," he said, "that the Fascisti are to Italy what the American Legion is to the United States. And that Mussolini, the new premier, was the commander of the Legion--the ex-service men--of Italy....The Legion is not in politics....But there is plenty of politics in the Legion--potential power, I mean."

(Page Insert)

Mr. Owsley has never repudiated his endorsement of Mussolini and Fascism.

On May 4 1935 the New England Methodist Council met at Lowell, Mass, where a member of the American Legion, and a former state chaplain, introduced the following resolution:

"We warn our people against the approaching menace of Fascism... sponsored quite noticeably by the American Legion, which attempts to disguise itself in the terms of patriotism." The resolution was adopted.

Almost every year from 1922 on, when Mussolini was invited by the San Francisco convention, new invitations have been sent to him, and many Legion delegations have visited him and returned to America full of praise of the Duce, Fascism, and trains running on time. In 1930 the Legion Boston convention invited Mussolini. Labor unions protested and forced a withdrawal.

Legion Invited Mussolini

In 1931 Ralph T O'Neill, national commander, presented to the Fascist ambassador de Martino resolutions of the National Executive Committee of the Legion in favor of Mussolini.

In 1935 Col Wm E Easterwood, national vice-commander of the Legion, invited Mussolini to the Chicago convention, made the Duce an honorary member of the American Legion, and pinned a button on him. (This action later was found unconstitutional, as the Legion has no honorary members).

In 1937 the editor of IN FACT was editor of a new magazine, Ken, owned by David Smart, owner of Equire. Smart agreed to publish a series of articles on the Legion, but when he found out that one of its commanders, Franklin D'Olier, was also head of the Prudential Insurance Co and would refuse him advertising if the truth were told, suppressed the entire series of articles. (For the complete story of how Smart sold out Ken to the advertisers and the story of his sentence to 2 years in prison for stockrigging, see IN FACT Oct 6 1941.)

In order to document the charge of Fascism against Owsley and to give him a chance to retract his Fascist views, if he had changed his mind in the course of 15 years, Ken's editor wrote Owsley, who was then U S Minister to Ireland. Letter concluded: "I write to question you whether there has been any change in your opinion, or whether you wish to make any changes, before (NEA) gives me permission to quote copyright article."

By the time he answered, the Honorable Alvin Owsley was U S Minister to Denmark. Here is his reply:

(U S Seal) Legation of the United States of America
Copenhagen, January 6 1938

You have been good enough to refer to my comment, the contents of which is reported as an interview to the news service of the NEA in 1922, during the time I was privileged to serve as National Commander of the American Legion.

While not recalling independently the interview, no doubt I at the time reflected the real sentiment of the hopeful and confident legionnaire in the light of history then before us. We shall ever keep in mind the American Legion is pledged to uphold and defend the Constitution of the United States of America. Hence any action taken by the Legion will be within the Constitution.

Now only the newly elected National Commander is authorited to speak for the Legion....

You will recall that the instructions and regulations of the Diplomatic Service deny me the privilege of expressing an opinion in regard to the public affairs of any foreign government or discussing, outside the State Department, any issue of national or international significance.

With cordial regards,

Yours very truly,
Alvin Mansfield Owsley
American Minister.

But the most important documentary evidence of all exists in the files of the first un-Americanism Committee, the predecessor of the Dies Committee. This story was distorted or suppressed in 99% of the American press, and is therefore dismissed with a laugh fn all official Legion publications. Here is a tiny part of the evidence:

In 1934 leading members of the Legion conspired with Wall Street brokers and other big business men, to upset the government of the United States and establish a Fascist regime. They asked Smedley Butler, noted former commander of the U S Marines, to head the American Fascist march on Washington, and Butler not only refused, but insisted on exposing the plot and when newspapers refused to print the truth, he spent several years telling it from the lecture platform.

General Butler testified:

"Shortly after MacGuire [Gerald G. MacGuire, employee of the brokerage firm of Grayson M-P Murphy, and one of the founders of the American Legion] first came to see me he arranged for Robert Sterling Clark, a New York broker, to come to my house..." [MacGuire proposed Butler raise several hundred thousand Legionnaires to take over Washington]. To be perfectly fair to Mr. MacGuire he didn't seem bloodthirsty. He suggested that 'We might go along with Roosevelt and do with him what Mussolini did with the King of Italy.'

Butler thought this was treason. He arranged to have a friend, the newspaper rpporter Paul Comly French, present at subsequent talks with MacGuire. French testified before the MacCormack-Dickstein Committee:

"He (MacGuire) shoved a letter across his (Butler's) desk saying it was from Louis Johnson of West Va, former national commander of the American Legion. MacGuire said Johnson wrote he would be in 'to discuss what we have talked about'.

"'That's just what we are discussing now,' he told me.

"During our conversation he mentioned that Henry Stephens of North Carolina, another former nat'l commander of the Am Legion, was interested in the plan."

The Congressional Committee heard testimony from James Van Zandt, commander of the Veterans of Foreign Wars, completely supporting General Butler, and saying that he had known of this plot all along. Butler concluded his testimony by suggesting that the Committee question several persons on the subject of the plot to lead a Legion army to establish a Fascist regime in Washington, and notably: G M-P Murphy, Gov Ely of Mass, William Doyle, former dept commander of the Legion in Mass, and Commander Frank N. Belgrano of the Legion. Belgrano was called to Washington, but secret pressure was exerted and he was never called to testify. Murphy was a director of Guaranty Trust, a Morgan bank; also director of Anaconda Copper, Goodyear, Bethlehem Steel. He was treasurer of the DuPont-financed Liberty League. He was decorated by Mussolini and made a commander of the Crown of Italy. It was Murphy who raised a large part of the big money which started the Legion in Paris in 1919.

Clark, broker at 11 Wall St, was also one of the Liberty League financiers. Butler testified that Clark said: "I have got $30,000,000 and I don't want to

lose it. I am willing to spend half of the thirty millions to save the other half." In Butler's presence Clark phoned MacGuire to go ahead with a $45,000 fund to use at the American Legion convention to put through a resolution in favor of maintaining the gold standard. Such a resolution was passed.

When finally the MacCormack-Dickstein Committee published its findings, it suppressed certain parts of General Butler's testimony, notably the phrase "and in about 2 weeks the Liberty League appeared," thus connecting the Liberty League with the Legion plot. Also suppressed: French's testimony that MacGuire said he could get financing for a Fascist putsch from John W Davis, Morgan attorney, or Perkins of National City Bank; and that the guns would come from the Remington Arms; and that "one of the DuPonts is on the board of directors of the Liberty League and they own a controlling interest in Remington Arms Co."

Some of the most sensational parts of the testimony were suppressed by the press. Most papers suppressed the whole story or threw it down by ridiculing it. Naturally enough the press did not later publish the MacCormack-Dickstein report which stated that every charge Butler made and French corroborated had been proven true. The report concludes:

"Evidence was obtained showing that certain persons had made an attempt to establish a Fascist organization in this country. There is no question but that these attempts were discussed, were planned, and might have been placed in execution when and if the financial backers deemed it expedient." All the principles in the case were American Legion officials and financial backers. (Source: 74th Congress, 1st session; House of Representatives; Investigation of Nazi and other Propaganda. Printed Feb 15 1935; Pp 9, 10, etc.)

Labor Shows Way to Save Legion

The evidence of actual Fascism in the Legion could becontinued for pages. The record of anti-labor activities is one of the most violent chapters in American history. No less than 50 illegal acts of violence were committed in 1920, according to the ACLU 1921 report. Farmers Non-Partisan League speakers were tarred and feathered, many of Eugene V Debs' meetings were broken up, as was a concert by Fritz Kreisler. Kidnapping is a major crime but in 1935 Nick Bins, a racketeer, and several of his fellow members of the Racine Legion committed this crime. A newspaper man, posing as a customer, got Nick Bins to agree to do another kidnapping. Bins said (before a hidden microphine) that he would not murder the victim, but break his legs. There would be no difficulty if he were caught, said Bins, because all Racine judges are "100% OK" and especially Judge Belden, "a brother Legionnaire." For references for kidnapping and slugging, Bins suggested phoning "Chief Lutter of Racine." A $10 bill was handed Bins. Despite all this evidence it was almost impossible to get the law to act, but when Bins was finally jailed a group of Legionnaires kept him company and shouted they had "fixed" the case. A defense fund for Bins, "a fellow Legionnaire," was supported by the Chamber of Commerce. National headquarters of the Legion took no action except to expel Rahman-De Bella and John Philip Sousa posts for supporting a labor union.

In 1937, however, the nat'l commander issued an order that from then on no strikebreaking by the Legion was to be done in uniform. This was, of course, an admission that from 1919 to 1937 the Legion had been one of the main anti-

labor strikebreaking forces in the nation. Legionnaires were not told to be neutral in strikes, but to leave off their uniforms when they became strikebreakers.

However, the progress of democratic action in the Legion has been sure, although slow. Labor has been slow to take action. But now it is on the march, and it is the present move by labor which can provide the solution of the Fascist ideaology of the Legion.

A national convention of the American Legion consists of about 1300 delegates. Of these 1300, probably not 15 carry cards in labor unions. Yet there are tens of thousands of union men in the Legion. If they were in touch with each other, acting and speaking together in the interests of labor and against the reactionary top clique that has generally run the Legion, they could be a great democratizing and liberalizing influence. One post commander, an active union man, told IN FACT that if 2% of the organized workers of the country were in the Legion and thinking and acting in it like union men, they could control it.

Efforts to unify the trade union membership of the Legion have been made for years. In 1938 an advertisement in a Legion paper asked all labor posts to get in contact with the labor posts in Los Angeles. A few posts did, and a semi-organization was formed, but it was not until June 1942 that a real conference of trade union posts was held in Chicago.

A permanent organization was effected by the 31 posts represented in this National Conference of Union Legionnaires. The conference made its position known in a series of resolutions advocating a Second Front in Europe; approving Vice-President Wallace's Century of the Common Man speech--the conference also urged the Legion paper to carry the speech, but it didn't--; and condemning Westbrook Pegler and urging that his labor-baiting column be dropped from the new Army paper, Stars and Stripes. The next conference of the Union Legionnaires is planned for next May or June, in Detroit.

One of the main objectives of the Conference is to get the Legion to appoint a new standing committee, a National Labor Relations Committee. A resolution calling for the appointment of such a committee was passed by two national conventions of the Legion, but the brass hats in control have ignored this madate two years in succession.

Trade union posts of the Legion exist chiefly where the unions are strongest, although union men aremembers in many other regions. This is a fairly comprehensive survey of the union posts in the Legion today:

((Lists Union Labor Posts in L.A., Santa Fe, San Franc, Chicago, Milwaukee, Detroit, Pittsburgh, and N.Y.))

With such a nucleus, the outlook is good in the Legion for labor, provided thousands of union men realize their strength and use it now.

Los Angeles--LA Union Labor Post, with 400 or 500 members; Dawn Post, for workers on night shifts, theatrical men, etc; Newspapermen's Post and Musicians Post; Milton Kanoda Post, post office workers; Several posts in the movie companies.

Sante Fe--Sante Fe Post, mostly railroad workers.

San Francisco--Sam Gompers Post.

Chicago--Union Labor Post, with all types of union craftsmen. This is one of the oldest labor posts in the Legion, large and very active; Nerry Post, teamsters; Elevated Post, union workers on the Chicago L Lines; Electric Post, union building tradesmen; Firemen's Post, city firemen; 22 railroad posts in and around Chicago.

It should be noted that the Cook County convention of the Legion five years ago passed a resolution declaring the Legion's neutrality in labor disputes. It is actually a part of Legion ritual, also now a part of Dep't of Illinois by-laws, when the new post commander is inducted into office, for the retiring commander to enjoin him to be neutral on all labor disputes; but this is a rule mostly honored in the breach.

Milwaukee--Federation of Labor Post, restricted to AFL members.

Detroit--Detroit Union Labor Post, which invites CIO members. In the Monroe, Mich, steel strike the local Legion post went out in regalia to break up the picket line. Whereupon the Detroit Union Labor Post of Wayne County threatened to go up to Monroe and JOIN the picket line. The Monroe Legionnaires went home; Auto Workers Posts--in General Motors, Ford, Hudson, Chevrolet. These posts used to be subsidized by the companies, to carry the companies' banners at conventions, for the advertising. That was before the rise of the United Auto Workers Union, CIO.

Pittsburgh--Central Pittsburgh Post, which prints "Sponsored by the Central Trades and Labor Council" on its letterheads, and has 2 Negro officers, both from the Building Service Employees Union, AFL.

New York--Electrical Construction Post, Local 3, International Brotherhood of Electircal Workers; Painters Post, District Council 9; Plumbers Post, taking in all AFL plumbers; Philip Sousa Post, members of Local 802 of the Musicians union; Sign Writers Posts, artists, sign painters, etc.

M

Message from President Green of the A F of L

((Approving establishment of Union Labor Posts, and directing that members write to Mr George C Danfield, Chairman Labor Relations Committee, Chicago Union Labor Post No 745 of the American Legion, 2248 North Kimball Avenue, Chicago, Illinois, for full information and advice as to how to proceed in the formation of a Union Labor American Legion Post.))

I hope and trust that all members of the American Federation of Labor who served in the World War and who are eligible to membership in the American Legion will follow out the recommendations I have herein made that Union Labor Posts of the American Legion be formed, and in this way promote and advance the common interests of both the American Federation of Labor and the American Legion.

CONSTRUCTIVE
CRITICISM

THE AMERICAN LEGION STORY,
this issue, is an excellent example of what IN FACT does every week:

1. It prints the facts the newspapers suppress.
2. It fights native Fascism.
3. It offers constructive criticism. Having given its readers the facts it also tells them what they can do.

Right now every American must fight Fascism. If you can't pack a gun, you can get a handful of subscriptions to IN FACT. This weekly is a weapon against Fascism.

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Freedom of the Press.....50¢

American Broadcasting Company

CAREY LONGMIRE'S BROADCAST

Monday, August 12, 1946

Day after tomorrow the second great war of this century will have been over exactly one year. Today's big Washington sensations are the ones centering around the charges of graft .... corruption in that war .... wholesale inefficiency to the tune of billions of dollars.

The Mead committee of the Senate has been washing dirty linen dealing with the super-promoting Garsson brothers ..... the team of slick operators who ran a borrowed letterhead up to 80 million dollars or so worth of war contracts. The fervent friendship of the Garssons with Congressman Andy May of Kentucky, chairman of the House Military Affairs committee, has been told and re-told .... along with the details of how the Garssons's Washington lobbyist seemed to keep a stock of thousand-dollar bills in the safe, and used to take one or two out periodically to head up toward the Capitol.

Comptroller General Lindsay Warren charged before that same committee that Army officers left the government payroll to join private firms and handle the contract negotiations with Uncle Sam for those firms. Mr. Warren angrily charged that billions of dollars were lost to the Treasury in hurried renegotiation of war contracts. And he said: "From where I sat, it looked as if everybody was out to get the government in the war years."

Today the special House committee investigating surplus war property got the first of its crop of coming sensations into the headlines. That committee is headed by Missouri Congressman Slaughter .... the same man who was defeated for renomination last week in the Missouri primary, thanks to the personal and two-fisted intervention of President Truman, who said flatly that Mr. Slaughter, although calling himself a Democrat, votes against the Administration. The President said, "If he's right, I'm wrong."

Mr. Slaughter's committee is meeting with only the chairman and two other members attending the sessions. Both those others are Republicans, and they, like Mr. Slaughter, won't mind creating all the headlines possible to embarrass the Administration. Today's star witness was a Washington promoter and ex-convict named Ben Fields, who was also close to the Garsson combine. Mr. Fields gladly told the surplus investigating committee that he had located a hundred and 81 refrigerators in the government's surplus war stocks, and promptly put in a bid to buy those scarce articles at $800 apiece. The government's surplus administration, he said, wrote back that the price was $295 apiece. The refrigerators are waiting for him now, he said, in Philadelphia. The headline comes out that the government lost $91,000 through inefficiency .... bungling.

There will be far more charges such as those centering around the Garssons .... around Promoter Ben Fields. Many more names will inevitably be brought up .... many more headlines. Everybody remembers the stormy Senate munitions investigation a few years ago led by isolationist Senator Nye of North Dakota ..... the investigation which sought, apparently, to prove that it was J. P. Morgan who plotted America's entry single-handed into the first World War. The only difference this time seems to be that the sensational investigations have started earlier .... started while the sound of cannonfire and the dread spectre of the atomic bomb are still ringing in the world's ears.

But the real question is not the uncovering of a few Garssons .... a few instances of muddling and red tape in selling the surplus .... but setting a policy which will make such things impossible.

It all seems to go back to the old truism again that people deserve the government they get. In an age of cynical materialism .... an age when a common watch-word is "what's in it for me?" .... how can John Q. Citizen expect a world conflagration to come along, requiring the lavish tossing-away of billions, without huge and spectacular waste, and graft?

It is the opinion of Senator James Mead of New York, the chairman of that Senate committee which has been making the headlines on the Garsson case, that a real and effective merger of the Army and Navy, with the creation of a brand-new war procurement program, is the way to stop profiteering in a new war if that new war breaks out.

The world prays that that new war does not come. But if it does, America must certainly be better organized than for the last one.

Mr. Mead says: "The slick promoters, such as the Garssons, with their Erie Basin combine -- all built on government money without even a plant or a piece of equipment at the start -- could never have got a start if the procurement of the armed forces had not been in almost complete chaos."

The Senator goes on. He says: "Before the Army and Navy trained young officers every year in battle tactics. Strategy. Officers studied the battles of Lee, Stonewall Jackson, Nelson. Few learned about the thing which proved vital in this war ... how to convert a peacetime factory into an arsenal for war.

"When the Garssons or others came along with glib promises, no one in the Army or Navy really knew whether those promoters could turn out bullets or machine guns or some other war item or not. If the story sounded good, the promoter got a letter of intent .... a preliminary contract for production.

"The peacetime auto industry fought the first proposals to turn auto plants into production. People said it couldn't be done. It required all kinds of negotia- in Washington, by the President and everyone else," continues the Senator, "to ade industry that the output of normal, peacetime goods had to be stopped. That thing had to be used for war.

"The military procurement services floundered. Thousands of dollar-a-year men from private industry poured into Washington to organize the production for war."

Senator Mead puts his finger on the necessary remedy now when he says:

"What we need is to organize the Army and Navy into a single department of de- se. Then train production officers in the same way we train fighting officers. A business man would have gone bankrupt in a week if he had tried to do business in the chaotic way the Army and Navy supply people did in the war. The nation has to have a detailed, complete industrial mobilization program .... a program all set to go, in an emergency ... with the trained personnel to mobilize the nation overnight. And to do the job without waste. A necessary part of that program," Senator Mead concludes, "is stiff price control and high taxes to curb excess profits."

Was this basic kind of program suggested before our entry into the war? Certainly it was .... by Bernard Baruch .... who in 1939, a day or so after Hitler invaded Poland, urged that American commence then to organize a tight system for defense. He urged freezing of prices, profits and wages. Mobilization of capital and labor in the event of war. The Baruch plan would have meant no profiteering, no inflation ... and all-out war.

Americans couldn't be bothered. We kept hoping until Pearl Harbor that the war would not touch us. Then it took months to get plants reconverted from peace to war. For lack of a real policy backed up a hundred per cent by John Citizen, there was inevitable waste. Delay. Profiteering. No one can be at all surprised, today, when Comptroller General Warren reports that billions were wasted .... tossed down the sewer.

What is being revealed today is simply the inevitable result of the confusion and floundering of three, four and five years ago.

Navy brass hats .... along with influential Congressmen ... still balk President Truman's efforts to create a unified command of defense. Still fight the President's Army-Navy merger. A correspondent at Pearl Harbor reports that the Army and Navy command setup in the Pacific is just about as chaotic as at the time of the Japanese attack there on December 7th, 1941. Admiral Towers, Navy commander there, has no authority over the Army ground or air forces, although he is theoretically responsible for Hawaii's defense. By a directive of April, 1945, all Army men in the Pacific are under the sole command of General Mac Arthur. Is that divided command a reflection of the lessons of war?

Congress gets a lot of brickbats. It's the fashion for Americans to laugh at Congress .... or to criticize. It's the fashion to lash at bureaucrats ... to attack Washington generally. Yet the politicians skilled at creating sensational headlines are often the only ones whose names are known to the voters. The Bilbos, the Rankins, make controversies. But for every one of those sensation-hunters, there are three or four hard-working Senators and Representatives in Congress who labor long hours trying to keep up with legislation, attending committee sessions, running errands for constituents. That last chore is the most time-consuming of all. Votes are what counts in a politician's life, and the errands must be run .... in Congress or in a City board of aldermen.

A letter to the editor of the New York Herald Tribune this morning from a New ...rk Congressional candidate .... a Republican named J. K. Javits .... has more solid ...se in it on foreign policy than this reporter has seen in print in months.

Mr. Javits, I might add, is running for Congress from the 21st New York District in New York City. He asks just where the furious name-calling .... the battle of power politics in the Paris conference .... is leading. There at Paris every one of the 21 nations realizes that what is happening is not a mere attempt to write treaties of peace with the five Axis satellite powers of Italy, Bulgaria, Romania, Hungary and Finland. Every diplomat knows that Paris is really the scene for a contest of wills, of spheres of influence, between Russia ... on one side ... and America and Britain, on the other. And Mr. Javits reports sharply and bitterly that this growing political division in the world can not lead to peace. It may very well lead to war .... no matter how right we think the words of Secretary Byrnes at Paris are... how wrong the words of Russia's Mr. Molotoff may be. This New York Republican says sharply the Republicans will get nowhere by simply echoing the words of the Democrat, Mr. Byrnes, in that power battle. He demands a Republican foreign policy of considerably more vision. And his argument boils down to this.

What every man, every woman and every nation on earth wants today .... says Mr. Javits .... is a higher standard of living.

The average per capita income for the world today is only $70 a year. In the United States .... a land of huge plenty, by comparison .... the average income is $1200 a year.

"What," demands Mr. Javits, "have we to fear from the Russians if we embark on a policy of helping to raise world living standards .... and, therefore, of helping them (the Russians) to raise their living standards?"

Mr. Javits sounds like a complete realist when he says the real fight between Russia and America in the world today is over whose economic system will win out .... Communism or capitalism. But he asks what have we to fear today, militarily, from a Russia whose steel income is a tiny handful as compared with ours? And steel is the basis of modern war.

Under the new Russian 5-year plan, Stalin has called for 25 million tons of steel a year. That's only about one-quarter of the capacity in the United States.

Therefore .... this candidate for Congress goes on .... there is little basis today for the hysterial fears of an immediate war with Russia which many Americans hold. Russia was almost mortally hurt by war. It will take her years to recover.

But the way to fight expanding Russian influence and spheres of influence, Mr. Javits says, is not merely to shake fists, utter harsh and biting words.

The way for America to beat the Russians, he argues, is to step out and rebuild a booming world trade. To demonstrate .... by helping other nations raise their standards of living ... that the American system works better than the Soviet system. A Soviet system with its repressions, its lack of free speech and free press and all the rest of it.

Almost exactly the same advice on a real foreign policy for America was given by two other Republicans -- the late Wendell Willkie, and Eric Johnston, the former president of the United States Chamber of Commerce.

America's policy of intervention in the civil war in China, it's admitted by General Marshall, is a failure. That armed intervention of ours.... intervention against the Chinese Communists, on the side of Chiang Kai-shek .... has failed to halt the Chinese Communists.

The economic approach might work better. And it might work better in Europe, in the Balkans .... in other spots where American and Russian influence are colliding head-on today and arousing the bitter words being aired at Paris. Soviet Delegate Vishinsky enlivened the proceedings there today with a charge of "insult" aimed at Secretary Byrnes, who was presiding. That sort of incident holds about the same revelance to the basic issue between Russia and America as the black headlines on the Garsson case do on the basic weaknesses in the war mobilization setup of the United States.

The harsh words at Paris, like the Garsson case here, get the headlines. But they are both mere symptoms of the basic trouble.

A real policy for America's effort to win the peace must be found. Name-calling obviously won't work.

American Broadcasting Company

CAREY LONGMIRE'S BROADCAST

Substituting for Elmer Davis

Tuesday, August 13, 1946

The stern British order last night to halt the flood of refugees slipping into Palestine has produced the result anyone could have foreseen. Tonight at least three persons in the Palestine port of Haifa lie dead. Others are wounded. When British troops seized a thousand illegal immigrants to Palestine ... seized those hapless refugees from Europe to send to concentration camps on the Island of Cyprus ... there was an immediate outburst.

A swarm of other Jews defied the British curfew. Raced down Haifa's streets to grab rocks ... bottles ... anything else they could find to toss at the armed guards surrounding the docks. The rifles and tommy-guns of the British rang out. One of those killed was a 19-year-old girl.

Last night's statement from London was stern. Britain's government ... a Labor government, some of whose Labor party members used to denounce repression in Palestine when the Tories held power in London ... that new Labor government of Britain issued a defiant defense of its course of action. A huge and illegal network of underground agents, British spokesmen say, is organizing the emigration of the Jews of Europe to Palestine ... and doing it on a wholesale scale. The British statement denounced "Zionist extremists" ... said Britain had been a genuine friend to the world's Jews. Yet ... went on the British reasoning ... the unprecedented arrival in the Holy Land of so many thousands of refugees had inflamed the Arabs. The whole Moslem world is in a furore over the mass entry into Palestine of those whom the Arab League considers its enemies. To prevent the flaming-up of war between Jews and Arabs, the British statement argued, stern measures against the flood of incoming Jews were necessary.

Today a British official charges that the cause of the trouble is American financing. Newspapers over the United States carry advertisements appealing for cash to finance the exodus of the Jews on the illegal underground plying between the refugee camps of Germany and Palestine, and, continues this British spokesman angrily, some of the advertisements say frankly it's a war between "American dollars" and "British arms".

Yet where does the real responsibility lie?

The conclusion is inescapable that Britain's hot-headed attempt to hold back the tide must fail. In the slave days in America, the underground railroad to take black men north to freedom operated despite every attempt to check it. Attempts to keep the Jews out of Palestine ..\ their one land of hope ... must inevitably fail, too. A surging tide of a harassed race seeking freedom can no more be turned back than King Canute could halt the sea. And the Labor government of Britain would be wise to admit it.

There is much more to this explosive business of Palestine, however, than just the question of Jews fleeing to safety there from war-torn Europe ... despite attemptsto stop them.

Palestine is essentially a bargaining point at this moment ... another pawn in the roaring battle of power politics between Russia and the Western Allies. What London really wants in Palestine is to force the United States into a tighter

guarantee of the nervous British foothold all through the Middle East, all through the Mediterranean ... on the life-line of Britain's empire to the Orient.

Britain has taken her forces out of Egypt. She plans now to put her chief base for armed forces in the Middle East in Palestine. Thus Palestine is a vital base ... militarily ... for the protection of British oil supplies from Iran and Iraq. Vital for forces watching over Suez. Britain issued a stern threat the other day to take "unilateral action" ... if required ... to maintain her interests in the south Iran oil fields. Iranian Ambassador Hussein Ala, here in Washington, is angered by that threat.

Yet it's Russia to whom the British threat is really directed. Britain is jittery over Russian attempts to seize spheres of influence in Iran and the rest of the Middle East. Britain is jittery because of Russia's note to Turkey, just revealed ... Russia's note to Turkey demanding that Russia, and not Turkey alone, have a hand in controlling the Dardanelles, that key gateway from Russia's Black Sea to the Mediterranean. At Paris, Britain and America are battling to keep Russia and her satellite Tito, of Yugoslavia, out of Trieste -- another gateway to the Mediterranean sea.

The shocking British acts in Palestine ... a rule of guns ... is a mere reflection of the British terror of the spreading might of Soviet Russia. Britain feels she must, at all costs, strengthen her hand in Palestine. And she objects strongly at the words uttered so frequently in Washington, calling on the British to open the gates to immigration in Palestine, for reasons of simple mercy. Almost a year ago, at the London conference of foreign ministers, Secretary of State Byrnes suggested to Britain's Foreign Secretary Bevin that Britain immediately permit a hundred thousand more Jews into Palestine as President Truman had requested. Mr Bevin angrily blazed back:

"You fellows are free with advice, but you take none of the responsibility. You give me two American divisions to help keep order in Palestine, and then we'll talk about more refugees there."

Mr. Byrnes dropped the subject.

Today's tragic events in Palestine ... slayings which no one can defend ... are not the important center of battle. The place where London is trying to force a real decision on Palestine's future is the White House, in Washington.

At Paris ... at all the other recent Allied diplomatic conferences ... America and Britain have battled Russia. A huge battle for power, for spheres, has been taking place between those two blocs ... a Russian bloc and an Anglo-American bloc. It has got to the point of shows of force; London talks today of possible joint maneuvers in European waters of the British and American navies. And in the British view, it is completely illogical for Washington to try with one hand to resist the Russians and with the other hand to weaken a vital British base ... in Palestine ... which is a bastion against expanding Russian influence.

That's why Mr. Bevin made his undiplomatic comment a few weeks ago which aroused such instant anger from many Americans ... his utterance in June, when he said the American agitation for the admission of Jews into Palestine was simply "because they did not want too many of them in New York." British spokesmen have made similar remarks ... one Briton said yesterday that the only reason American politicians have an interest in the Palestine question is because of Jewish votes.

At any rate, President Truman has on his desk the pro and con opinions of numerous advisers on the latest British partition plan for Palestine ... a scheme to cut up Palestine into four parts. The British would hold two of the four parts, including some important oil reserves. The Jews would control a small section about a third as large as the separate Arab section. Judge Hutcheson of Texas, the chairman of the American members of the British-American inquiry committee which recently spent much time in the Holy Land looking into the issues, came to Washington last week to denounce the British scheme as "a sellout." But Ambassador Henry Grady ... another of Mr. Truman's advisers ... recommends acceptance of the partition scheme. At first, the British insisted that unless Mr. Truman okays their Palestine scheme, they could not accept the American idea of joining the occupation zones of Germany... a point on which we have placed great insistence.

Thus tonight the fate of Palestine and of the tens of thousands of homeless Jews of Europe ... the remnants of a people almost wiped out on that continent by Hitler ... rests in the hands of one man ... the President of the United States. London flatly threatens that unless he accepts the harsh British program, no refugees will get to Palestine.

But cries for freedom cannot be silenced. Guns cannot stop the determined bid of a people for a home.

For too long, it seems, America's role in the raging battle for spheres of world power seems to have been mere acceptance of that power battle, with little real thought as to how to stop it. We have had policies of expediency for too long ... the policy of "Darlanism" in North Africa. Of backing a hopeless entry in the Italian horse race ... the little King ... who has now been evicted, by vote of the Italian people. We have played the game of expediency in China... and we proclaim that despite General Marshall's flat confession of the failure of that policy, we are going to maintain American Marines in China. Maintain them there to help back up Chiang Kai-shek in his civil war with the Chinese Communists. Tough old "Vinegar Joe" Stilwell ... the fighting general who sought to use the power of the Chinese Communists on the Allied side during the war ... and was then evicted from China by Washington at the demand of Chiang Kai-shek could doubtless have told General Marshall or the President, in the first place, that this policy in China of American armed intervention would not work.

It is high time that the basis of American policy in the world be returned to one of simple justice. In Palestine, the issue is far more clear than it is in most places ... and justice is clearly on the side of offering a refuge to thousands without hope. President Truman, it seems clear, should reject the British scheme for Palestine, and do so unequivocally.

The fight for special favors ... for spheres of influence, so to speak, is not restricted to foreign affairs. For two days -- here in Washington -- warm arguments have been going on before the new Price Control Board. Arguments in a tug-of-war between contesting factions just about the same as that taking place in Paris and elsewhere.

This Washington agrument is on the prices of certain essential commodities ... meat, dairy products, grains and other things ... to take effect August 21st.

Livestock men and others declare hotly that price ceilings will not be needed after the 21st of the month. An economist for the American Federation of Labor charged that Congress passed an "emasculated" price control act which "failed to protect the people." The labor men demanded that the ceilings on meat and milk go back.

Two bankers ... tall Roy Thompson of New Orleans and black-haired Daniel Bell of Washington ... and an Ohio paper pulp manufacturer from Dayton ... George H. Mead ... make up the three-man board. Congress last month heard the thousands of claims for price increases from hordes of lobbyists ... from men who denounced the O.P.A. as a wicked organization holding up production. When Congress passed a price law reflecting many of the lobbyists' demands, President Truman angrily tossed the bill back. The Congressmen wearily set up the new De-control board to be judge and jury for the food price issue. It's a sardonic touch to note that the place where the price hearings are going on is the same big room of the Senate Office Building where witnesses have been unfolding the story of the Garsson combine of asserted war profiteers ... and the manipulations of Congressman Andrew May.

So many special pleaders want to be heard ... pleaders for or against more boosts in the cost of living ... that the Control Board has to limit most witnesses to 10 minutes. Ed O'Neal, chief of the powerful Farm Bureau, got a half-hour on the opening day. Mr. O'Neal complained that "as a Nation, we have become used to cheap food." Mr. O'Neal was against food price ceilings.

Here again, up in that big room of the Senate Office building, the real issues lie deeper than what's on the surface.

The two bankers and the pulp man from Ohio are deciding about prices of beefsteaks ... but they also ... and far more important ... are deciding whether America is to have a new wave of violent strikes ... or a period of labor peace.

Labor ... just as the A.F. of L. man said today ... is angry at the skyrocketing living costs since the 30th of June. A.E. Lyon, of the railroad labor unions, told the board that rail union workers will "not stand for further increased prices." If further prices are not stopped, Mr. Lyon went on, "it is doubtful that anyone will be able to prevent wildcat strikes in protest." And wildcat strikes would inevitably be followed by much bigger ones.

At today's price levels, it seems possible for the heads of the big labor federations to hold back any major strikes. C.I.O. President Philip Murray, for one, has fought against strike threats ... fought to maintain present wage and price ratios. He tells C.I.O. members they must maintain the present value of the dollar.

But if the board now meeting here should recommend that the ceilings on such vital foods as meat, milk and grains be kept off ... the country is almost inevitably bound for more explosions in labor.

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American Broadcasting Co

RAYMOND SWING'S BROADCAST

Wednesday, August 14, 1946

It is a melancholy thought that only a year has passed since the war came to an end. It has been a cruelly long year, full of enough animosity and disillusionment to stock a dozen uneasy years. Nor does it become less melancholy to be reminded that the first year after the First World War was more unsettled and more discouraging. What came after the First World War was the Second World War. But there is nothing to point to in this past year's events to convince anyone that the Second World War will not be followed by a third one. And every urchin on the street now knows it would be the worst war ever fought. Indeed it might wipe out the last vestiges of culture and freedom, perhaps for generations.

THE CAUSE OF SURVIVAL

After a great war, a let-down is inevitable. What made the moral purpose so high in the allied lands during the war was the danger of defeat. We could not afford to be selfish and bad allies. We disliked and distrusted our allies and they disliked and distrusted us. But we had to get along together, for not to would be to lose the war and to become slaves of an enemy who unashamedly practiced a new and dreadful brand of slavery. But the discipline of danger has relaxed, whereas, if we only realized it, we should sense a still greater danger, and together should seek the peace as ardently as we sought victory in the war.

But we are tired, certainly tired of trying to understand our allies. We want the peace to be made our way according to our ideas, and our allies, each in his own way, wants it made his way for his benefit. We have lost a common cause, the cause of victory. And we have not discovered a new common cause, the cause of survival, which can only come through an assured peace. It does little good to assess the blame for this condition, finding one or another country more at fault, more churlish, more grasping than another. Though no doubt the Soviet Union has behaved less congenially and has been more boldly selfish than we, it does not change Russian policy for us to point this out.

After the last war, one could at least entertain some hope for the newly conceived League of Nations. In it no single power was to be safe in defying the rest of the nations. There was at least the possibility of a united world holding in check any single aggressor, or if force was needed, to defeat such a nation in short order. So there appeared to be an alternative to all-round destruction. But today there is no such alternative, the choice is between annihiliation and agreement. And though this is obvious, we and the Russians, and the British and the other nations, are not choosing agreement, but are dead set on having things our way whatever the cost.

Anyone trying to weigh the chances for peace in the year following the close of the last war and on this anniversary today, would be quite right to choose the year 1919. The outlook was better then. That is not to say that the third world war will soon be upon us, or that it cannot be averted. Of course it can be. It is only to say that this year has not produced the wisdom, insight and leadership to avert it. And that is what makes it hard to hail this anniversary with anything better than melancholy.

CRISIS IN CHINA

Crises in three countries are in the news today, China, Turkey and Palestine. In China Generalissimo Chiang Kai-Shek made a statement commemorating the anniversary of Japan's surrender. It was in no way a response to the challengingly pessimistic

statement last weekend of General Marshall and Ambassador Stuart. It has been hoped that the Nationalist leader would at last pledge application of the political proposals made by the People's Consultative Conference, and at least might call for the Council to meet again in view of all that has happened since it adjourned.

But instead, he repeated the old formula that there can be no political peace until the Communists subordinate their military forces to the National Government, the formula which has prevented a coalition up till now. He did promise to convene a constitutional convention on November twelfth, and he did promise to abide by agreements of the Political Consultative Conference. He admitted that government officials must review their own mistakes. But he spoke of "putting down the rebellion" in China, which however pleasantly the words may have rung for the right-wing of the Kuomintang party, will not promote political peace with the Communists. The Generalissimo would have shown that he is ready for a political settlement with the Communists if he had made some reference to the unreconstructed tories in his own ranks who heretofore have made the political settlement difficult for him to negotiate. But no such candor was shown, and the stalemate in China must be described staler today than it was yesterday.

The Turkish crisis arises from the delivery in Ankara of a note from the Soviet Government proposing revision of the Montreux Convention governing the Dardanelles. The Russians ask that the establishment of a regime at the straits be confined to the Black Sea powers, that is, Russia, Roumania, Bulgaria and Turkey, to the exclusion of the other signatories of the Montreux Convention and the United States. And they ask that Turkey and the Soviet Union share in the defense of the straits, which the Turks take to mean that Russia wants bases at the Dardanelles. The Turks will reject the proposals, and are sure of British support and fairly sure of American support.

RUSSIA AND TURKEY

Here one can foresee a bitter controversy with the Russians over what was decided at Potsdam. The Russian note refers to an understanding reached there which has not been published before. It was that the three governments - Russia, Britain and the United States - agreed that the next step in the Dardanelles issue would be direct negotiations between each one of the three powers and the Turkish Government. The Russians are expected to contend that this was an authorization to go ahead and negotiate a new straits regime directly and bilaterally with Turkey. We and the British will say - quite honestly - that we meant that the three powers should set forth their views to Turkey in separate notes, perparatory to another Big Three conference on the subject.

The Montreux Convention can hardly be rewritten without the signatories - minus Germany and Japan and with the United States - having a hand in it. Thr Russian proposal to the contrary is described by a correspondent of the New York Times in London as "a diplomatic atomic bomb." But the United States is more likely to be interested in having a share in the negotiations than it is to show unending opposition to a Russian defense of the straits. A New York Herald Tribune dispatch from Paris says that State Department officials now there agree that Russia is within its rights in requesting partial control of the straits. However, if sharing the defense of the straits means admittance of Russian troops within Turkey, that would force Turkey to become a member of the Soviet group of nations, whether it wants to or not. Since it doesn't want to, there will be objection to this solution.

It will be difficult to find a compromise that gives Russia partial control over the straits and leaves Turkey its unimpaired sovereignty. In a world based on sovereignties, both rights exist. But if Turkey is to be kept in the British group of states, Russia cannot be guaranteed the adequate defense of the straits to which it

is entitled. Internationalization of the straits would be a wholesome solution if only Western and Russian diplomacy were not already committed so heartily to mutual antagonism. That being the situation, the Russians are sure to regard internationalization as a form of defeat.

TRUMAN PROPOSAL FOR PALESTINE

The Palestine crisis occupied the British Cabinet at a special meeting today. But President Truman's counter-proposal to the Joint Cabinet Committee policy arrived too late for consideration today. Though there is no official disclosure of this counter-proposal, it is widely assumed that he asks immediate resumption of immigration into Palestine and calls attention to a plan of the Jewish Agency of Palestine for a much more liberal settlement of the Jewish problem than the Cabinet Committee proposal.

The Jewish Agency plan calls not for a federation within Palestine itself, but outright partition of Palestine, with a considerably larger territory for the Jewish portion. This sounds like the revival of an older plan for the creation of a genuine Jewish state, which then would become member of a Middle Eastern Federation, which always has appeared to be a statesmanlike approach to the Palestine problem. The partition would be followed at an early date by the end of the British mandate, though the Jewish State could be counted on as offering bases and military guarantees to Great Britain.

Success of this plan, or any plan at all, would, however, depend on its acceptability to both Jews and Arabs. And since the Jewish State would be considerably larger than proposed by the Cabinet Committee, the need to take care of Arab interests would be even greater. This might be met by attaching the Arab state to the new state of Trans-Jordan, which would assure the support of the Arabs of that country. But it still would make it essential that there be enough money to raise Arab living standards. So the American provision of a couple of hundred million dollars may still be needed. Helping the Arabs by projects like the TVA would raise their standard of living, and thereby go far to assure peace in one of the most contentious political spots of the world. Some object to this as a "bribe" to the Arabs, which is a curious name for bringing civilization to a backward people and thus serving the cause of peace. It is a textbook example of how American leadership can best be exercised abroad.

A big point in the Jewish Agency plan is that the two new states would have complete autonomy, particularly as to immigration. If an agreement along these lines came into view the British might consent to start at once on bringing in a hundred thousand Jews into the Jewish territory. President Truman is believed to have insisted that the hundred thousand be admitted without waiting for any long-term plan to go into effect.

He is also reported as considering a plan for the admission of fifty thousand displaced Europeans into the United States under a special immigration quota. The scheme would have to have approval of Congress, and would provide that when some country fails to use its full quota the unused portion would be allotted to a country with an excess of persons seeking to come to the United States. In this way we could plan without going beyond the limit for immigration already set by Congress.

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American Broadcasting Company

RAYMOND SWING'S BROADCAST

Thursday, August 15, 1946

The so-called peace conference in Paris was enlivened today by another act in the drama of American-Russian antagonism. Secretary Byrnes, in the main speech of the day, answered some of the attacks against the United States made in the last three days. The American Secretary of State is a superb debater and made a telling speech, which in its words delivered a number of messages, and in its intent contains still another one.

MR BYRNES EXPLAINS

One message in words was that America could not be considered one of the countries which grew rich out of the war, as had been hinted by the Russian delegate. Mr Byrnes pointed out that we had spent four hundred billion dollars on the war, a handsome part of it for Russia with regret only that the Russian part could not have been larger, he said. Another message in words was that in advocating trade equality for all countries, we are not seeking exclusive advantage for ourselves, but only conditions which alone can save small countries from becoming economic vassals of a stronger nation.

That argument is at the root of the whole economic policy of the American Government abroad, and looks to be so utterly reasonable to the average American that he does not understand that it is often interpreted quite differently abroad. For when we claim access to all markets on even terms, our rivals think we are financially so strong and so much better equipped that we are sure to undersell them. So our free trade looks to them like a disguise for economic imperialism, and the charge levelled against us as imperialists is based largely on what we count our most enlightened economic policy. But Mr Byrnes did not go into these aspects of the policy, and sounded very much like Cordell Hull, suddenly become eloquent.

The motive underlying the speech was to undo the effect of the last three days' debate, which has made it seem that the Soviet Union alone goes down the line for its friends, while the United States and Great Britain leave their satellites in the lurch. In particular Italy had to be reassured that generosity is to be expected from us and the British. Mr Byrnes today praised the democratic character of the present Italian Government, defended the Italians who had been attacked for not agreeing with everything wanted by the Russians, and pointed out that what we require of the Italians, namely the restoration of United Nations property lost or damaged during the war, will hurt Italy much less than what Russia wants, namely reparations. For Italy will pay for United Nations property in its own coin and the money will have to be spent in Italy, whereas reparations will come out of Italian economy and leave the country.

He also made a generous reference to Greece, pointing out the great debt owed the Greek people for their courageous stand against the Germans, with all it meant in time gained by the Allies during the war. This is not more generous than is owing the Greek people, but inasmuch as the present government of Greece is headed toward the worst and most explosive kind of reaction, it did line us up on the side of a regime whose character is open to legitimate criticism. But at least Mr Byrnes demonstrated that it pays to have the United States for a friend.

PERON "CONVERSION"

Most any day an accord between the United States and Argentina is to be expected, based on President Peron's belated implementation of the Pan-American program to root out Nazi connections. This will be the work of Ambassador Messersmith, credited with being one of our better and more aggressive democratic diplomats - democratic with a small "d" - who has a record of stalwart opposition to fascism. But it will take some persuading to convince all Americans that the Peron regime is changing its nature in response to mere arguments by an American ambassador. What seems more plausible is that the open feud between the United States and Argentina was becoming too costly to both sides, and so is being disposed of.

Colonel Peron has already gone to the length of telling a newspaper correspondent that if there is another world war Argentina will be on the side of the United States. That was to counter any unfortunate impressions that might have been made by the resumption of diplomatic relations with the Soviet Union. Colonel Peron is ready to go further. He will come clean on the Nazi issue, so as to bury the feud with America, enjoy a reconciliation - and perhaps even receive military aid.

What helps make this conversion of Colonel Peron unconvincing is that his regime is not of a kind to be changed by words or promises. The Colonel is no democrat, with a belief in the diffusion of power as characteristic in a democracy, or with faith in the rule of law protecting individual rights. Just now there is an undercurrent of unrest in Argentina. Colonel Peron yesterday said publicly that if anyone was thinking of starting a revolt he himself would act the week before. "It is," he said, "all a matter of giving a few feet of rope to the Descamisadas," - the so-called "shirtless workers" who support him - "and then we shall see who hangs." That has the true Hitler ring. The Colonel said he has half a million workers behind him, and went on to quote Napoleon's remark that "with me at the head, that makes a million." He also said it is necessary to form a single party as soon as possible, and added, "to govern is not my profession. My profession is that of a soldier, and I shall die fighting."

These quotations, from a dispatch by Frank Kluckhorn in the New York Times, are to be read in conjunction with a statement of Dr Peralta, Director of Migration in Argentina, that plans for the immigration of General Anders' entire Polish army await only the Government's approval. What is left of the Anders army consists of reactionaries who refused to go home to live under the present Polish government. "Negotiations to bring the two hundred thousand men with their families," Dr Peralta said, "are almost settled. They will bring with them their entire equipment, including their tanks, which we will immediately convert to tractors." This sensational news was buried in a Buenos Aires interview which highlighted the much less sensational news that a thousand quislings from Norway also are to be admitted to Argentina, as part of a fifty-year plan to increase the country's population to a hundred million.

ARGENTINE FASCISM

Dr Peralta talked straight racialism, saying that the superior Argentine people of tomorrow will evolve from the technically superior people of the world, selected from what he called "these best racial types". He stressed that it is necessary to "avoid the settlement of racially inferior people", and went on to divulge that the bulk of immigrants would comprise Italians, Spaniards, Scandinavians, Irish and Arabs. This is not the same racial catalogue as Hitler's by any means, but racialism does not fit comfortably into any system of society other than fascism. Dr Peralta denied being anti-Semitic, and pointed to the admission of five thousand Arabs as proof of his belief that Semites are good as basic colonists, a statement that would do credit to a Goebbels.

But all this is of minor weight, in comparison with the news that the whole Anders army with its weapons is coming to Argentina. For that at once will alter the balance of power in Latin America. True, Dr Peralta did say that Polish tanks will be immediately converted into tractors. It sounds well, but suppose the tanks remain tanks, Argentina will have a seasoned and equipped army of two hundred thousand men, which is larger than the standing army of the United States in 1939.

Colonel Peron, the man who hopes to die fighting, and much prefers fighting to governing, will have a handsome force to lead into battle. Now, it may just be that Colonel Peron anticipates leading the Anders army, and other armed European reactionaries, against the Soviet Union at the side of the United States in another world war, and has nothing else in view. But the dream of Argentina has not been to be a brother to the United States, but the spearhead of Latin America against the United States.

Fascism is bound to go to war in time, it is a form of society that draws its breath from the lungs of war. First it must make itself strong in comparison with its immediate neighbors. That is what is now going forward at an astonishing rate, with astonishing success. Later it will be promoted to big league competition. And anyone who believes the Anders army in Argentina is going exclusively into farming and that its tanks will be transformed into tractors, is indeed trusting. And so is anyone who thinks the Anders army is never to be used against any enemy but Russia.

THE KLAN AND THE BUND

It is, of course, wrong to point out fascist potentialities in our hemisphere neighbors without recognizing such potentialities in our own land. And mention should be made of the evidence now at hand linking the Ku Klux Klan with the German Bund. It is fascinating to find that this evidence is in the hands of the Attorney General of New York State. For only recently the Un-American Activities Committee of the House, after looking the Klan over, announced there was no need to investigate it. The refusal of this committee to defend America from this un-American organization is not surprising, in view of the persons who dominate the committee. But it becomes increasingly difficult to understand how Congress as a whole can sponsor decisions of this sort made in its name.

New York State has succeeded in revoking the charter of the Klan in that state, having now won its suit before the State Supreme Court New Jersey is bringing suit to invalidate the Klan charter in that state. And in Georgia, suit is being brought in the Federal Court to revoke the national charter of the Klan. Assistant Attorney General Duke of Georgia says that he obtained from Attorney General Goldstein of New York photographs, letters, and other documentary evidence of links between the Klan and the Bund. These two organizations laid plans before Pearl Harbor to merge into a single anti-American organization. After the war started and the Bund was dissolved, collaboration was continued by leaders of the two bodies. It may astonish some people to hear the Klan called fascist. It is only an infant and infantile kind of fascism. But it has in it most of the raw materials of fascism, and needs only a good start and a talented leader to become the backbone of a real fascist movement. What should shock people who have regarded the Klan as some peculiarly American kind of aberration is to learn that the Klan felt so at home with the Bund that it could plan a complete merger with it.

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American Broadcasting Company

RAYMOND SWING'S BROADCAST

Friday, August 16, 1946

Shortly before the First World War, when most people were taking world peace for granted, a man in England sat down to write a book about the discovery of the atomic bomb, about the greatest and last war that would ensue, and then the creation of a world government. His book stands out as one of the remarkable prophecies of our epoch. It is not distinguished by great narrative merits, or its perfected prose. It has never reached a wide public. Even those who read voraciously at that time might easily have missed it, while most readers of today are almost certain not to know it first hand. It was the work of a former drygoods clerk who was the son of a professional cricket player and who lived to become one of the most widely known writers of his time. This particular book was swamped by the outbreak of World War One. It was called "The World Set Free" and its author was H G Wells, who died Tuesday of this week in London at the age of seventy-nine.

WELLS AS PROPHET

Like most good prophets, Wells did not like to be called one. For a true prophet is not a mere predictor, trying to win acclaim by hitting off what is going to happen to the astonishment of his fellowmen. A real prophet is a person with understanding of the universe and of mankind. He understands so much that he can discern trends that others fail to see, and can create in his mind the developments that society has not yet gone through. When he lets his imagination soar it flies toward the center of truth, not away from it. His phantasy on such flights is not simply reason taking a holiday, but reason on a voyage of exploration.

I know that Wells was not the only writer to use the theme of the atomic bomb before it actually was produced. I have received dozens of letters from listeners calling my attention to remarkable prophetic writings about the atomic era by a number of writers. But Wells was the most distinguished prophet of the era of science which we have entered, and for a good many persons of my generation he built up their faith in reason and science and in the capacity of men to order their affairs for their good.

To read "The World Set Free" today is to find it grotesquely wrong about much in the atomic era, and almost to wonder how a man who was so wise as to make the bomb in the workshop of his imagination was not wise enough to see precisely what effect it must have on the world. For Wells let the release of atomic energy result in its immediate application to industrial purposes, with a resultant hurricane of prosperity ending in a great depression years later, and the military use of the bomb was only then thought about. Thereupon followed the last great war which led to the establishment of a world government.

The scientist Holsten, who learned how to release atomic energy in this book, did it in his own laboratory, using bismuth. And the atomic bomb, when it was perfected, did not produce a single explosion, but set up a long series of explosions, which is the concept of the chain reaction mistakenly applied. But Wells wrote this in 1914, five years before Lord Rutherford had succeeded in changing the structure of the atom in the experiments that formed the foundation of the ultimate release of atomic energy. He wrote before air warfare was much more than a dream. He wrote before war on a world scale, with its millions of casualties and its vast areas of devastation, had become realities for all.

ATOMIC REVOLUTION

Holsten, his scientist, set up his atomic disintegration in a minute particle of his bismuth, and it exploded with great violence into a heavy gas of extreme radio-activity. After a year he was able to show that the last result of this rapid release of energy was gold. "Holsten knew," Wells wrote, "that he had opened a way for mankind, however narrow and dark it might still be, to worlds of limitless power." And white with fatigue he went to Hampstead Heath where he watched all the people promenading in their Sunday clothes, and felt like "an imbecile who has presented a box full of loaded revolvers to a creche."

There he encountered an old school friend and they sat down to a drink while he poured out to him the revelation of what he had achieved. "In the end," he said, "before many years are out, this must eventually change war, transit, lighting, building, every sort of manufacture, even agriculture, every material human concern --." But this recital was interrupted by his friend starting up to pursue his dog which had darted away, doing so with loud calls and whistlings. Then when the friend came back, apologizing that one must look after his dog, he asked: "What was it you were telling me?" And that is not so far from the indifference with which much of the world in real life has greeted the release of atomic energy.

We now know that the development of atomic energy for peaceful purposes needs many years of further research. The best that is within reach today is the use of radioactivity for tracer purposes in medicine, and the use of the radioactive pile to make heat on a large scale. But Wells jumped over these difficulties, and had automobiles and aeroplanes using atomic energy, and all industry undergoing a revolution; but so without guidance and planning that chaos resulted.

Then in the nineteen fifties, in the midst of a world-wide depression, came the first inklings of war. The Central Powers were about to attack the Slavic states, and the Western Powers were going to come in to help the Slavic states. The war did not start out with atomic bombs, with air warfare on a vast scale. Wells had such contempt for war departments that he could not imagine their being abreast of science. But finally the atomic bomb was used, first against Paris, then Berlin, then city upon city.

PREVIEW OF ATOMIC WARFARE

He does not go into much detail about the war, but he has this description of a ruined Paris that is arresting: "Whole blocks of buildings were alight and burning fiercely, the trembling ragged flames looking pale and ghastly and attenuated in comparison with the full-bodied crimson glare beyond. The shells of other edifices already burned rose pierced by rows and rows of window sockets against the red-lit mist . . . Few who adventured into these areas of destruction and survived attempted any repetition of their experiences. There are stories of puffs of luminous, radioactive vapor drifting sometimes scores of miles from the bomb center and killing and scorching all they overtook. Moreover the air in this infernal inner circle of red-lit ruins had a peculiar dryness and a blistering quality, so that it set up a soreness of skin and lungs that was difficult to heal."

That is a most remarkable preview of atomic warfare as we already know it. Such, he says, was the last state of Paris, and such on a much larger scale was the condition of Chicago, and the same fate had overtaken Berlin, Moscow, Tokyo, the eastern half of London, Toulon, Kiel, and two hundred and eighteen other centers of population or armaments. "Each," wrote Wells, "was a flaming center of radiant destruction that only time could quench. In the map of nearly every country of the world, three or four red circles, a score of miles in diameter, mark the position of

the dying atomic bombs and the death areas that men have been forced to abandon around them. Within these areas perished museums, cathedrals, palaces, libraries, galleries of masterpieces, a vast accumulation of human achievement, whose charred remains lie buried, a legacy of curious material that only future generations may hope to examine."

Wells has the establishment of world government inspired by a Monsieur Le Blanc, French Ambassador to the United States, a man with a glowing simplicity and zeal like that of our own Robert Lee Humber of today. Le Blanc arranges a world conference to be held on the meadows by Lake Maggiore in northern Italy. King Egbert, the young King of England, takes the lead by throwing in his sovereignty for the world sovereignty, joined by the President of the United States and enough others so that a world government can be proclaimed. It sets out first of all to get control of all the material from which atomic energy was being derived - called Carolinum in the book, and after asserting its authority, and having one formidable rebellion which it puts down with a good bit of luck, the new era is ushered in.

BRAVE NEW WORLD

Wells always was a utopian, and his world set free experiences utopian conditions which are described with benign and most appealing language. "We seem," he wrote, "to have entered upon an entirely new phase in history in which contention as distinguished from rivalry has almost abruptly ceased to be the usual occupation and has become at most a subdued and hidden and discredited thing. Contentious professions cease to be honorable employment for men. The peace between nations is also a peace between individuals. We live in a world that comes of age. Man the warrior, man the lawyer, and all the bickering aspects of life, pass into obscurity. The grave dreamers, man the curious learner and man the creative artist, come forward to replace these barbaric aspects of existence by a less ignoble adventure."

"It was the habit of many writers of the twentieth century," he continued, "to speak of competition and the narrow private life of trade and saving and suspicious isolation as though such things were in some exceptional way proper to the human constitution, and as though openness of mind and preference for achievement over possession were abnormal and rather unsubstantial qualities. How wrong that was, the history of the decades following the establishment of the world republic witnesses. Once the world was released from the hardening insecurities of a needless struggle for life that was collectively planless and individually absorbing, it became apparent that there was in the vast mass of people a long smothered passion to make [illegible] world broke out into making, and at first mainly esthetic making. The majority of our population consists of artists, and the bulk of activity in the world lies no longer with necessities, but with their elaboration, decoration and refinement."

No doubt all this happened too swiftly to be duplicated in real life at that speed. But we may be sure that H. G. Wells, the apostle of reason and the servant of science, would have us believe that it is no further from possibility than the release of atomic energy seemed to be in 1914.

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ΔΙΑ ΤΗΝ ΚΑΤΑΠΟΛΕΜΗΣΙΝ ΤΗΣ ΕΛΟΝΟΣΙΑΣ

ΜΕΤΑ

ΑΠΛΩΝ ΟΔΗΓΙΩΝ ΠΡΟΣ ΑΠΟΤΕΛΕΣΜΑΤΙΚΗΝ ΚΑΙ ΟΙΚΟΝΟΜΙΚΗΝ ΧΡΗΣΙΝ ΤΟΥ ΕΝ ΕΛΛΑΔΙ ΠΑΡΕΧΟΜΕΝΟΥ DDT 1946

UNITED NATIONS RELIEF AND REHABILITATION ADMINISTRATION
HEALTH DIVISION **** SANITATION SECTION
ATHENS, GREECE MAY 1, 1946

ΔΙΕΥΘΥΝΣΙΣ ΥΓΕΙΑΣ ΤΜΗΜΑ ΕΞΥΓΙΑΝΣΕΩΣ
ΑΘΗΝΑΙ, ΕΛΛΑΣ 1 ΜΑΪΟΥ 1946

ΠΡΑΚΤΙΚΗ ΕΦΑΡΜΟΓΗ ΤΟΥ ___

ΔΙΑ ΤΗΝ ΚΑΤΑΠΟΛΕΜΗΣΙΝ ΤΗΣ ΕΛΟΝΟΣΙΑΣ

Μετά
ὁδηγιῶν πρός ἀποτελεσματικήν καί οἰκονομικήν
χρῆσιν τοῦ ἐν Ἑλλάδι παρεχομένου D.D.T.
1946 *

I. ΓΕΝΙΚΟΤΗΤΕΣ

Εἰς ὅλας τάς ὑπαιθρίους καί οἰκιακάς δοκιμάς ἀποδεικνύεται τό DDT τό κάλλιστον ἐντομοκτόνον, ἐξ ὅσων ποτέ ἐχρησιμοποιήθησαν. Διά νά εἶναι ἀποτελεσματικόν, ἐν πάσῃ περιπτώσει, πρέπει νά χρησιμοποιῆται εἰς τάς καταλλήλους θέσεις καί συμφώνως πρός μεθόδους, τάς ὁποίας συνιστοῦν πρόσωπα ἔχοντα ὁλοκληρωτικήν βιολογικήν γνῶσιν καί κατανόησιν τῶν εἰδῶν τῶν ἐντόμων, τῶν ὁποίων ἐπιζητεῖται ἡ καταπολέμησις. Μικρά ποσότης DDT καταλλήλως διασκορπιζομένη εἶναι καλυτέρα ἀπό μεγάλην τοιαύτην διασκορπιζομένην εἰκῆ καί ὡς ἔτυχεν.

Ἐάν μία ἐπιφάνεια ψεκασθῇ μέ διάλυσιν DDT, μετά τήν ἐξάτμισιν τοῦ ὑγροῦ λεπτοί κρύσταλλοι παραμένουν ὁμοιομόρφως κατανεμημένοι. Ὁ θάνατος τῶν ἐντόμων ἐξαρτᾶται ἐκ τῆς ἀναλογίας ἀπορροφήσεως αὐτῶν τῶν μορίων διά τοῦ σώματος ἤ τῶν ποδῶν τῶν ἐντόμων. Ὀφείλουν νά ἔλθουν εἰς ἐπαφήν μέ τήν ἐπιφάνειαν τήν ψεκασθεῖσαν μέ DDT διά ν'ἀπορροφήσουν μίαν θανατηφόρον δόσιν. Πρόσωπα χρησιμοποιοῦντα DDT πρέπει νά ἐνθυμοῦνται ὅτι ἐνεργεῖ βραδέως καί φονεύει τά ἔντομα μόνον ἀφοῦ ταῦτα ἔλθουν εἰς ἐπαφήν μέ τάς ἐμμόνους ἐναποθέσεις τοῦ DDT. Λίγα λεπτά ἤ πολλάς ὥρας μετά τήν ἐπαφήν ἀναπτύσσεται ἰσχυρά δρᾶσις ἐπί τοῦ νευρικοῦ συστήματος τῶν ἐντόμων· καθίστανται ἀνήσυχα καί προσπαθοῦν νά διαφύγουν· αἱ κινήσεις των γίνονται ἀκανόνιστοι· κραμπαίνουν καί ὡς λέγεται προσεβλήθησαν ἀπό DDTισιν. Τελικῶς

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Ὑπηρεσία Δημοσίας Ὑγείας Ἡνωμένων Πολιτειῶν
Ὑποδιευθυντής Τμήματος Ἐξυγιάνσεως, U.N.R.R.A.

PRACTICAL FIELD APPLICATION OF DDT

FOR MALARIA CONTROL

with
simple directions for effective and economical uses
of the DDT available in Greece
1946 *

I. GENERAL

In all field and household tests DDT is proving to be the best insecticide that has ever been used. To be effective, however, it must be applied carefully to the proper places according to recommended procedures by individuals, who have a thorough biological knowledge and understanding of the insect species for which control is desired. A little DDT efficiently spread is better than a lot spread haphazardly.

When a surface is sprayed with DDT solution, tiny crystals are left evenly distributed after the liquid has evaporated. Death to insects is determined by the rate of absorption of these particles through the insects body or feet. They must touch the DDT treated surface in order to absorb a lethal dose. Individuals applying DDT must remember that it is slow acting and kills insects only after they come in contact with the DDT residual deposits. A few minutes or several hours after contact a powerful action is created in the insects' nervous system; they become restless and attempt to escape; their movements become poorly coordinated; they stagger about and are said to have "the DDT's".

They finally develop tremors, convulsions, and some die after 10 minutes, others may survive for 48 hours. However, once they touch the DDT, death is usually inevitable.

As an insecticide, DDT is a new and revolutionary discovery. Its

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ἐμφανίζουν τρόμους καὶ σπασμούς καὶ μερικοὶ ἀποθνήσκουν μετὰ 10 λεπτά, ἄλλα ὅμως δύνανται νὰ ἐπιζήσουν ἐπὶ 48 ὥρας. Ὁπωσδήποτε, ἐφόσον ἅπαξ ἔλθουν εἰς ἐπαφὴν μὲ τὸ DDT ὁ θάνατος εἶναι συνήθως ἀναπόφευκτος.

Ὡς ἐντομοκτόνον τὸ DDT εἶναι νέα καὶ ἐκπληκτικὴ ἀνακάλυψις. Ἡ χρῆσις του ὡς ἐμμόνου ψεκασμὸς ἀποτελεῖ νέαν ἀπίτευξιν διὰ τὴν καταπολέμησιν τῶν ἐντόμων. Ὁ κύριος σκοπὸς τῆς χρησιμοποιήσεως τοῦ DDT ὡς ἐμμόνου ψεκασμοῦ εἶναι νὰ σχηματίσωμεν μίαν λεπτὴν κρυσταλλικὴν ἐναπόθεσιν , ἥτις θὰ φονεύῃ τὰ ἔντομα τὰ ὁποῖα ἔρπουν ἢ ἐφάπτονται ἐπὶ τῶν ψεκασθεισῶν ἐπιφανειῶν. Τὰ κύρια πλεονεκτήματα τοῦ DDT ἔναντι τῶν προηγουμένως χρησιμοποιηθέντων ἐντομοκτόνων εἶναι ὅτι:

(1) Πολὺ μικραὶ ποσότητες, καλῶς διασκορπισμέναι, θέλουν δώσῃ καλὰ ἀποτελέσματα.

(2) Τὰ παραπεταμένα ἔμμονα ἀποτελέσματά του θέλουν φονεύῃ τέλεια ἔντομα ἐπὶ μακρὰν χρονικὴν περίοδον μετὰ τὴν χρησιμοποίησίν του εἰς τὰς θέσεις τῆς νυκτερινῆς καὶ ἡμερησίας ἀναπαύσεώς των.

(3) Εἶναι σχετικῶς εὔκολος ἡ παρασκευὴ καὶ χρησιμοποίησίς του καὶ εἶναι ἐλαφρῶς τοξικὸν εἰς τὸν ἄνθρωπον.

(4) Ἔχει πλῆθος ἐφαρμογῶν ὡς σκόνη, διάλυσις εἰς πετρέλαιον, γαλάκτωμα ὕδατος εἴτε ὡς θερμικὴ ἐξίερωσις, χρησιμοποιούμενον διὰ τῆς χειρός, μηχανοκινήτων ψεκαστήρων ἢ ἀεροπλάνων, ἀναλόγως τῶν περιστάσεων. Ἡ καλλίστη παρασκευὴ καὶ μέθοδος χρήσεως θὰ κοικίλῃ ἀναλόγως τῶν εἰδῶν, τῶν ὁποίων ἐπιζητεῖται ἡ καταπολέμησις, τῶν ἐπιτοπίων συνθηκῶν, τοῦ μεγέθους τοῦ προβλήματος καὶ τῶν παρεχομένων ὑλικῶν καὶ μέσων.

Κατὰ τὴν διάρκειαν τοῦ 1946 ἡ UNRRA θ'ἀποστείλῃ τεραστίας ποσότητας DDT εἰς τὴν Ἑλλάδα καὶ εἰς ἄλλας χώρας πρὸς χρῆσιν διὰ τὴν καταπολέμησιν ἐντόμων ἰατρικῆς σημασίας.

Τὸ τεῦχος τοῦτο προορίζεται ὡς ὁδηγὸς τῶν ἐργατῶν ὑπαίθρου, ἐκ τῶν ὁποίων ἀναμένεται νὰ κάμουν τὰς πλέον πρακτικάς, ἀποτελεσματικὰς καὶ οἰκονομικὰς χρήσεις τοῦ DDT μὲ τὰ παρεχόμενα ὑλικὰ καὶ μέσα.

use as a residual spray is a new approach to insect control. The major purpose of using DDT as a residual spray is to form a fine DDT crystalline deposit that will kill insects which crawl over or touch the treated surfaces. The main advantages of DDT over previously used insecticides are that:

(1) Very small quantities, well dispersed, will give good results.

(2) Its prolonged residual effects will kill adult mosquitoes a long period of time after its application to their nocturnal and diurnal resting places.

(3) It is relatively easy to prepare and apply and is only slightly toxic to man.

(4) It has a wide range of application as a dust, an oil solution, a water emulsion, or as a thermal aerosol when applied by hand, power sprayers, or airplanes, according to the circumstances. The best preparation and method of application will vary according to the species for which control is desired, on field conditions, the magnitude of the problem, and the materials and equipment available.

During 1946 U.N.R.R.A. will send considerable quantities of DDT to Greece and other countries for use in the control of insects of medical importance.

This brochure is intended as a guide to field workers who will be expected to make the most practical, effective and economical applications of DDT with the material and equipment available.

Διά τήν σκόπιμον, οἰκονομικήν καί ἀποτελεσματικήν διενέργειαν τοῦ ἀνθελονοσιακοῦ ἀγῶνος, εἶναι ἐξαιρετικῶς σημαντική ἡ προσεκτική σπουδή καί κατανόησις τῶν συνηθειῶν τῶν εἰδικῶν εἰδῶν κωνώπων, τῶν ὁποίων ἐπιδιώκεται ἡ καταπολέμησις. Τά εἴδη ποικίλουν κατά τάς συνηθείας δήματος, ἀναπτύξεως, διασπορᾶς καί ἱκανότητος πρός μετάδοσιν τῆς ἑλονοσίας· κατά συνέπειαν, εἶναι σημαντική μία πλήρης γνῶσις τῆς βιολογίας τῶν κωνώπων, πρίν ἤ δυνηθῶμεν νά χρησιμοποιήσωμεν τό DDT σκοπίμως ἐπί τῶν πλέον ἐνδεδειγμένων ἐπιφανειῶν. Ὁ ψεκασμός θά ἔπρεπε νά ἐκτελῆται εἰς θέσεις, ὅπου οἱ κώνωπες ἀναπτύσσονται, ἀναπαύονται κατά τήν διάρκειαν τῆς ἡμέρας εἴτε λαμβάνουν τά παράσιτα τῆς ἑλονοσίας κατά τήν νύκτα.

Ὁ ψεκασμός μιᾶς οἰκίας μέ DDT εἶναι ἀποτελεσματικός ἐπί ἕως 10 συνεχεῖς ἑβδομάδας. Ἐάν κώνωψ εἰσέλθη εἰς οἰκίαν, ψεκασθεῖσαν μέ DDT δαγκάση ἑλονοσοῦντα ἄσθενῆ καί διαφύγη χωρίς προηγουμένως νά ἔλθη εἰς ἐπαφήν μέ ψεκασθεῖσαν ἐπιφάνειαν μέ DDT πρό τῆς παρόδου 12 ἡμερῶν εἶναι ἱκανός νά μεταδώση σποροζωΐδια ἑλονοσίαν εἰς ἄλλο πρόσωπον. Ἐάν ἡ τύχη τον παρέλθη καί ἔλθη πρός ἀνάπαυσιν ἐπί ἐπιφανείας ψεκασθείσης μέ DDT καί φονευθῆ, διασπᾶται ἡ ἑλονοσιακή ἄλυσσος μεταξύ τοῦ σχηματισμοῦ μεροζωΐδίων καί σποροζωΐδίων.

Τό DDT δέν δρᾶ ὡς ἀποκρουστικόν τῶν ἐντόμων, μέχρις ὅτου ἔλθουν εἰς ἐπαφήν μετά ψεκασθείσης ἐπιφανείας. Θά πρέπει νά ἔχωμεν ὑπ'ὄψιν ὅτι μετά τό ψεκασμόν οἰκοδομήματός τινος διά DDT οἱ κώνωπες δέν εὑρίσκονται ἐκεῖ ἀναπαυόμενοι κατά τόν κανονικόν τρόπον. Τό γεγονός ὅτι δέν εἶναι δυνατόν νά εὑρεθῶσιν κώνωπες διά τῶν συνήθων ἐπιθεωρήσεων, δέν σημαίνει ὅτι ἐξηφανίσθησαν οἱ κώνωπες ἐν τῇ περιοχῇ. Δυνατόν νά συνεχίσουν νά εἰσέρχωνται πρός ἀναζήτησιν αἵματος κατά τήν νύκτα καί, ἐάν μεγάλαι συνοθροίσεις κωνώπων ἐχρησιμοποίουν τό οἰκοδόμημα ὡς ἡμερήσιον καταφύγιον πρωτοῦ ἐσυτο ψεκασθῆ διά

II. MOSQUITO BIOLOGY

For intelligent, economical, and effective malaria control operations, it is extremely important that the habits of the particular mosquito species for which control is desired are carefully studied and understood. The species vary in their biting habits, breeding habits, distribution, and ability to transmit malaria; therefore, a thorough knowledge of mosquito biology is essential before DDT can be applied intelligently to surfaces where it will do the most good. Spraying should be done in places where mosquitoes breed, rest during the day, or acquire their malaria parasites at night.

When a house is sprayed with DDT it is effective for 8 to 10 continuous weeks. If a mosquito enters a DDT treated house, bites a malaria patient, and escapes without first touching a DDT treated surface; before 12 days have passed, and she is capable of transmitting malaria sporozoites to another person, her luck will run out and she will come to rest on a DDT treated surface and will be killed; thus breaking the malaria chain between merozoite and sporozoite formations.

DDT does not act as a repellent to mosquitoes until they touch a treated surface. It should be remembered that after a building has been sprayed with DDT, mosquitoes will not be found resting there in the normal way. The fact that mosquitoes cannot be found by routine inspections does not mean that all mosquitoes in the area have been eliminated. They may continue to come in at night for blood, and if large congregations of mosquitoes used the building as a diurnal shelter before it was sprayed with DDT, the chances are others will continue to come into it in the

DDT εἶναι πιθανόν ἄλλοι κώνωπες νά συνεχίζουν νά εἰσέρχωνται κατά τήν αὐγήν, ἀλλά θά τό ἐγκαταλείπουν ἐσκευασμένος μετ'ἐπαφήν περίπου πέντε λεπτῶν ἐπί ἐπιφανειῶν ψεκασθεισῶν μέ DDT καί θά ἀποθνήσκουν εἰς τό ὕπαιθρον.

Κατά τάς πρακτικάς ἐφαρμογάς τοῦ DDT διά τήν καταστροφήν τῶν κωνώπων, τό ὑλικόν πρέπει εἴτε νά ψεκάζεται ἐπί τῆς ἐπιφανείας τοῦ ὕδατος, ὅπου ἀναπτύσσονται, εἴτε νά ἐπιτίθεται ὡς ἔμμονος ψεκασμός ἐπί τῶν ἐπιφανειῶν, ἐπί τῶν ὁποίων θά ἔρχωνται τά τέλεια ἔντομα πρός ἀνάπαυσιν. Ψεκασμός οἰκοδομημάτων εἴτε ἄλλων θέσεων, μή κατοικουμένων ὑπό ἀναπαυομένων κωνώπων κατά τήν διάρκειαν τῆς ἡμέρας οὔτε συχνοζωμένων ὑπό τῶν ἀναζητούντων αἷμα κατά τήν νύκτα, εἴτε ψεκασμός ἐπιφανειῶν ὕδατος, ἐντός τοῦ ὁποίου δέν ἀναπτύσσονται προνύμφαι, εἶναι ἀπώλεσις χρόνου καί ὑλικοῦ.

III. ΜΕΣΑ ΔΡΑΣΕΩΣ

Λόγω τῆς μεγάλης τοξικότητός του τό DDT χρησιμοποιεῖται πάντοτε ἐν συνδυασμῷ μέ ἄλλα ὑλικά, ὅπως αἱ σκῶναι, τά πετρέλαια ἤ ἄλλοι διαλῦται. Εἶναι ἀδιάλυτον εἰς τό ὕδωρ, ἀλλά ὕδωρ δύναται νά χρησιμοποιηθῇ ὡς "ἀραιωτικόν", ἐάν προστεθῇ γαλακτωματικόν τι εἰς τόν διαλύτην. Εἷς καλός διαλύτης διά τό DDT εἶναι μεγάλης σημασίας. Παράγωγα τοῦ πετρελαίου, ὅπως τό φωτιστικόν πετρέλαιον, τό πετρέλαιον καύσεως, τό ἀκάθαρτον πετρέλαιον, τά λιπαντικά ἔλαια, εἴτε τά "χαμένα" ἔλαια μηχανῶν θά εἶναι εἰς πολλάς περιπτώσεις οἱ μόνοι παρεχόμενοι διαλῦται καί κατά συνέπειαν θά εἶναι οἱ πλέον πρακτικοί διαλῦται πρός χρῆσιν. Αὐτοί οἱ διαλῦται χρησιμοποιοῦνται διά τήν παρασκευήν διαλύσεως 5% DDT ὅταν παρέχεται μόνον καθαρόν DDT καί οὐχί ἕτερος διαλύτης.

Ἁπλοῦν φωτιστικόν πετρέλαιον δύναται νά χρησιμοποιηθῇ διά τήν παρασκευήν διαλύσεως 5%. Καλύτερος διαλύτης, ὅπως τό ξυλόλιον, χρησιμοποιεῖται διά τήν παρασκευήν συμπεπυκνωμένων διαλύσεων 35% διά γαλακτώματα.

early morning at the break of dawn, but will leave hurriedly after about five minutes contact with the DDT treated surfaces and will die outside.

For practical applications of DDT to kill mosquitoes, the material must either be sprayed on the water surface where they are breeding, or applied as a residual spray to surfaces where the adults will come to rest. To spray buildings or other places not inhabited by resting mosquitoes during the day, nor frequented by those seeking blood at night, or to spray water surfaces not producing larvae, is a waste of time and material.

III. DISPERSING AGENTS

Because of its high toxicity, DDT is always applied in combination with other agents, such as dusts, petroleum oil or other solvents. It is insoluble in water, but water may be used as a diluent when an emulsifier is added to the solvent. A good solvent for DDT is very important. Petroleum products such as kerosene, fuel oil, Diesel oil, lubricating oil, or waste crankcase oil will be the only solvent available in many places and will, therefore, be the most practical solvent to use. These solvents are used for making a 5% solution of DDT when pure DDT and no other solvent is available.

Crude kerosene can be used to make a 5% solution, but a better solvent such as xylene, is used for making 35% DDT emulsion concentrate solutions.

IV. ΜΟΡΦΑΙ, ΤΥΠΟΙ ΚΑΙ ΧΡΗΣΕΙΣ ΤΟΥ DDT

1. Μορφαί τοῦ παρεχομένου DDT

Αἱ ἀκόλουθοι μορφαί τοῦ DDT παρέχονται ἢ πρόκειται νά παρασκευασθῶν πρός χρῆσιν κατά τό 1946.

1. 100% Καθαρόν DDT

Λευκή, κολλώδης, κρυσταλλική οὐσία, μή παρεχομένη δι' οἰκιακήν χρῆσιν. Χρησιμοποιεῖται διά τήν παρασκευήν διαλυμάτων DDT πρός ψεκασμόν.

2. 10% Σκόνη DDT

Τό DDT ὑπ' αὐτήν τήν μορφήν ἠλέσθη ὁλοκληρωτικῶς ἐντός ἀδρανοῦς τινός, ὅπως ὁ παραφυλλίτης ἢ ἡ τάλκης. (Τό καθαρόν DDT δέν δύναται νά ἀραιωθῇ ἐπί τόπου πρός χρῆσιν ὡς σκόνη, ἐφ' ὅσον δέν παρέχονται εἰδικαί βαρεῖαι ἀλευστικαί συσκευαί, αἱ ἀναγκαῖαι πρός ἄλευσιν.) Αὐτή ἡ σκόνη DDT πρέπει νά χρησιμοποιηθῇ πρός καταπολέμησιν τῶν φθειρῶν· ὁπωσδήποτε εἶναι ἀποτελεσματική διά τήν καταπολέμησιν τῶν ψύλλων, κορέων καί κατσαρίδων, ἄν καί διάλυσις 5% εἶναι περισσότερον ἐπιθυμητή. Ἰδιῶται δέν θά ἔπρεπε νά προσπαθοῦν νά παρασκευάσουν διάλυμα DDT εἰς πετρέλαιον ἐξ αὐτῆς τῆς σκόνης 10% DDT, καθ' ὅσον τά 90% τοῦ ἀραιωτικοῦ θά ἔκαμνον μῖγμα ὑγρόν πρακτικόν καί ἀκατάλληλον πρός χρῆσιν.

3. 20% DDT εἰς βαρύ ἔλαιον (Πολυμεθυλναφθαλῆναι)

Χρησιμοποιούμενον διά τήν παραγωγήν θερμικῆς ἐξαερώσεως διά ψεκασμοῦ ἐξ ἀεροπλάνων διά τήν καταπολέμησιν τῶν προνυμφῶν τῶν κωνώπων. Ἀκατάλληλον δι' ἅμμονον ψεκασμόν εἰκιῶν, καθ' ὅσον τό μαῦρο ἔλαιον θά κηλιδώνῃ καί θά λαδώνῃ πολλάς ἐπιφανείας. Ἐν πάσῃ περιπτώσει, ἐάν παρίστηται ἀναγκαῖον νά ἀραιωθῇ αὐτή ἡ μορφή τοῦ DDT πρός χρῆσιν δι' ἅμμονον ψεκασμόν εἰς σταύλους, ἀγροικίας κλπ. εἴτε πρός χρῆσιν διά

IV. DDT FORMS, FORMULATIONS AND USES

A. Forms of DDT available

The following forms of DDT are, or will be, available for use in 1946.

1. 100% Pure DDT

A white, sticky, crystalline substance not issued for household use. Used for making DDT spray solutions.

2. 10% DDT Powder

The DDT in this form, has been thoroughly ground into a diluent such as pyrophyllite or talc. (Pure DDT cannot be diluted in the field for use as a dust since the special heavy grinding equipment necessary for miling will not be available). This DDT Powder is to be used for lice control; however, it is effective in the control of fleas, bedbugs, and cockroaches, although a 5% DDT solution is more desirable. Individuals should not attempt to make a DDT oil solution from this 10% DDT powder, since the 90% diluent in it would make such a mixture impractical and undesirable to use.

3. 20% DDT in Heavy Oil (Polymethylnaphthalene)

Used to produce thermal aerosol sprays from airplanes for mosquito larvae control. Not suitable for residual house spraying as the black oil will stain and oil many surfaces. However, if it becomes necessary to dilute this form of DDT for use as residual sprays in stables, outbuildings etc. or for hand application for larvae control add:

τήν κατασκεύασιν τῶν προνυμφῶν προσθέσατε:

1 : 3 μέρη ἀκαθάρτου πετρελαίου = 5% DDT
1 : 7 " " " = 2,5% DDT

Χρησιμοποιεῖται ὑπό ἀεροπλάνων ὡς 20% ἔνυδον ἀραιώσεως. Δι'ὅλας τάς ἄλλας χρήσεις πρέπει νά ἀραιωθῇ εἰς τό ἀπαιτούμενον κατάλληλον ποσοστόν.

4. 35% συμπεπυκνωμένον γαλάκτωμα

Δι'αὐτόν τόν τύπων πρέπει νά χρησιμοποιηθῇ ἕνας καλός διαλύτης ὅπως τό ξυλένιον (ἀδύνατος ἡ χρῆσις καθαροῦ πετρελαίου) καί ὡς γαλακτωματικόν θά χρησιμοποιηθῇ Τρίτον X-100. Τό διάλυμα τοῦτο παρακαταθήκης δύναται νά ἀραιωθῇ ἐπί τόπου μέ καθαρόν ἤ ἁλμυρόν ὕδωρ πρός παρασκευήν τῶν ἐπιζητουμένων διαλύσεων ψεκασμοῦ 5% ἤ 2,5% διά προσθήκης:

1 : 6 μερῶν ὕδατος = 5% DDT
1 :13 " " = 2,5% DDT

Τό παρασκεύασμα τοῦτο εἶναι ἐπαίρετον πρός ψεκασμόν τῶν ἐσωτερικῶν ἀραίων κατοικιῶν, καθ'ὅσον δέν κηλιδώνει τοίχους, παραπετάσματα κλπ. Ἐν πάσῃ περιπτώσει, τό ὕδωρ δύναται νά προκαλέσῃ ξεθώριασμα τοῦ χάρτου. Εἶναι ἰδιαιτέρως χρήσιμον διά τήν καταπολέμησιν τῶν προνυμφῶν τῶν κωνώπων, καθ'ὅσον τό διάλυμα παρακαταθήκης δύναται νά ἀραιωθῇ ἐπί τόπου δι' ὕδατος πρός αὔξησιν τοῦ διαλύματος ψεκασμοῦ. Τοῦτο συντελεῖ εἰς τερατώδεις οἰκονομίας εἰς τά ἔξοδα μεταφορᾶς.

5. 26% DDT συμπεπυκνωμένον γαλάκτωμα

Δέν εἶναι βέβαιον τί διαλύτης εἶναι εἰς αὐτό, ἀλλά ἀναμένομεν νά ἔχῃ τά αὐτά χαρακτηριστικά ὅπως τό 35%. Πρός χρῆσιν ἀραιώσατε μέ νερό:

1 : 4 = 5,2% ἤ
1 : 9 = 2,6% DDT διάλυμα ψεκασμοῦ.

1 : 3 parts oil = 5% DDT
1 : 7 parts oil = 2.5% DDT

It is applied from airplanes as a 20% without dilutions. For all other purposes it must be diluted to the proper percent required. (Water can not be used as a diluent unless an emulsifier is added.)

4. 35% DDT emulsion concentrate

In this formulation a good solvent such as xylene will be used (not possible to use kerosene) and triton x-100 will be used as an emulsifier. This stock solution may be diluted in the field with fresh or salt water to make the desired 5% or 2.5% spray solutions by adding:

1 : 6 parts of water = 5% DDT
1 :13 parts of water = 2.5% DDT

This preparation is excellent for spraying the interior of nice homes since it does not stain walls, curtains etc; however, the water may cause wall paper to fade. It is especially useful for mosquito larvae control since the stock solution can be diluted "on the spot" with water to increase the volume of the spray solution. This results in considerable saving in transportation costs.

5. 26% DDT Emulsion Concentrate

Not sure what the solvent in this will be but we expect it, to have the same characteristics as 35%. For use dilute with water.

1 : 4 = 5.2% or
1 : 9 = 2.6% DDT spray solution.

6. 5% DDT διάλυμα ψεκασμοῦ

Παρασκευαζόμενον ἀπό 100% DDT καθαρόν ἤ ἀκάθαρτον πετρέλαιον, εἴτε ὀλιγώτερον βαρυτέρων συμπυκνώσεων. Χρησιμοποιούμενον δι' ἔμμονον ψεκασμόν οἰκιῶν κατ' ἀναλογίαν 2 γραμμαρίων DDT (ἤ 40 γραμμαρίων διαλύματος 5%) ἀνά τετραγωνικόν μέτρον ψεκαστέας ἐπιφανείας. Κατά τάς πρακτικάς ἐφαρμογάς ὁ χειριστής θά ψεκάζῃ τάς ἐπιφανείας μέχρις ὑγρώσεως, ἀλλ' ὑχί ὑπερμολικῶς μέχρις ἀπορροῆς.

Χρησιμοποιῆσατε πρός καταπολέμησιν τῶν κρουμφῶν δι' ἑνός χειροψεκαστῆρος φλίτ κατ' ἀναλογίαν 0,25 χιλιόγραμμα ἀνά στρέμμα.

7. 2,5% DDT διαλύματα

Ἡ συμπύκνωσις αὐτή θά πρέπη νά χρησιμοποιῆται, ὅτε μεγάλη ποσότης ἐπιτίθεται διά γυλιοῦ ψεκαστῆρος. Προσεκτική ἐπίθεσις ἑνός γραμμαρίου DDT (ἤ 40 γραμμαρίων διαλύματος 2,5%) ἀνά τετραγωνικόν πόδα ἐπεδείχθη ἀποτελεσματική ἐπί 3 ἕως 5 μῆνας.

B. Χρήσιμοι τύποι

1. Διαλύματα πετρελαίου

Διαλύματα πετρελαίου εἶναι πολύ χρήσιμα ὡς ἀντιπρουμφικά. Δέν εἶναι εἰδικῶς κατάλληλα δι' ἔμμονον ψεκασμόν εἰς τό ἐσωτερικόν τῶν οἰκοδομῶν, καθ' ὅσον δημιουργοῦν κινδύνους πυρκαϊᾶς, ξηραίνονται βραδέως καί ἀφήνουν στίγματα ἐπί πολλῶν ἐπιφανειῶν, ἐν πάσῃ ὅμως περιπτώσει ἔχει χρησιμοποιηθῆ διάλυμα 5% DDT εἰς ἁπλοῦν φωτιστικόν πετρέλαιον μέ καλά ἀποτελέσματα.

Συμπύκνωσις 20% DDT εἰς Velsicol NR-70 χρησιμοποιεῖται ἀπό ἀεροπλάνων ἐφωδιασμένων μέ γεννητρίας θερμικῆς ἐξατμίσεως, λειτουργοῦσας διά τῶν καυσαερίων πρός καταπολέμησιν τῶν κρουμφῶν. Τό Velsicol

6. 5% DDT Spray Solution

Made from 100% DDT - kerosene, oil - or from dilutions of higher concentrations. Used for residual house spraying at the rate of 200 mg. of DDT (or 4 c.c. of 5% solution) per square foot of surface sprayed. In practical applications the operator will spray surfaces until wet but not to excessive run-off.

Applied for larvae control with a flit gun at the rate of 1 quart per acre. (1 acre = 4,840 square yards).

7. 2.5% DDT Solutions

This concentration should be used when a heavy application is applied with a knapsack type of sprayer. A careful application of 100 mg. DDT (or 4 c.c. 2.5% solution) per square foot has proven effective for 3 to 5 months.

B. Useful formulations

1. Oil solutions

Oil solutions are useful as mosquito larvicides. They are not particularly suitable for residual spraying indoors as they create fire hazards, dry slowly, and spot many surfaces, however, a 5% DDT in crude kerosene has been used with good results.

Twenty percent concentrations of DDT in Velsicol NR-70 is applied from airplanes equipped with exhaust generators to produce thermal aerosols for larvae control. Velsicol NR-70 (POLYMETHYLNAPHTHALENE) was selected for this use because it is a good solvent, and has a high boiling range and flash point.

N R - 70 (ΠΟΛΥΜΕΘΥΛΑΝΑΦΘΑΛΗΝΑΙ) ἐπροτιμήθη δι' αὐτήν τήν χρῆσιν ἐπειδή εἶναι καλός διαλύτης καί ἔχει ὑψηλήν θερμοκρασίαν βρασμοῦ καί ἀναφλέξεως.

α. Πρός χρησιμοποίησιν διά τῆς χειρός

5 χιλιόγραμμα καθαρόν DDT + 95 χιλιόγραμμα πετρελαίου = 100 χιλιόγραμμα διαλύματος 5% DDT.

Κατά τήν αὐτήν ἀναλογίαν μίγνυνται διάφοροι ἄλλαι ποσότητες.

β. Διά χρησιμοποίησιν ἀπό ἀεροπλάνου

'Αεροπλάνα ἐφωδιασμένα μέ γεννητρίας θερμικῆς ἐξαερώσεως χρησιμοποιοῦν συμπεπυκνωμένον διάλυμα 20%.

2 χιλιόγραμμα καθαρόν DDT + 8 χιλιόγραμμα Velsicol NR-70= 10 χιλιόγραμμα συμπεπυκνωμένον διάλυμα 20% DDT.

2. Γαλακτώματα ὕδατος

Τά γαλακτώματα ἀποτελοῦν ἰδεώδη μέθοδον διά τήν προετοιμασίαν τοῦ DDT. Ταῦτα ἱκανοποιοῦν πάσας τάς χρήσεις, τάς ὁποίας ἱκανοποιοῦν καί τά πετρελαιοδιαλύματα τοῦ DDT χωρίς νά ἔχουν τά ἀξιόμεμπτα χαρακτηριστικά τοῦ πετρελαίου. 'Εξοικονομοῦν μεταφορικά μέσα καί ἐφόδια ἐπί τόπου μεγάλων ὄγκων πετρελαίων, ἵνα χρησιμοποιηθοῦν ὡς διαλύται ἤ ἐραιωτικά. Οὕτω, τό DDT δύναται νά διατηρῆται εἰς διάλυσιν παρακαταθήκης δι' ἀκόλουθον ἀραίωσιν εἰς καθαρόν ἤ ἁλμυρόν ὕδωρ, ὅπως χρησιμοποιεῖται ἐπί τόπου.

Πρός χρησιμοποίησιν διά τῆς χειρός ἤ μηχανικῆς δυνάμεως διά τήν καταπολέμησιν τῶν προνυμφῶν εἴτε ὡς ἐμμονος ψεκασμός διά τούς τελείους κώνωπας.

35	χιλιόγραμμα	καθαροῦ DDT
64,5	"	Ξυλενίου
0,5	"	Τρίτον Χ-100

= 100 χιλιόγραμμα συμπεπυκνωμένον διάλυμα 35% DDT.

a. For hand application

(1) 7 oz. Pure DDT + 1 gallon oil = 5% DDT solution or

(2) 2½ pounds pure DDT + 5 gallons oil = 5% DDT solution or

(3) 22 pounds pure DDT + 50 gallons oil = 5% DDT solution.

b. For Airplane Distribution

Aircrafts equipped with thermal aerosol generators use 20% DDT concentrate.

2 pounds DDT + 1 gallon Velsicol MR-70 = 20% DDT concentrate.

2. Water Emulsions.

Emulsions form the ideal method for the preparation of DDT. They can be made to accomplish all that oil solutions of DDT can do and they do not possess the objectionable characteristics of oil. They save shipment, or procurement in the field, of large volumes of petroleum oils to be used as solvents or diluents. In this form, DDT can be kept in stock solution for subsequent dilution with fresh or salt water as it is used in the field.

For hand or power application for larvae control or as a residual spray for adult mosquitoes:

(1) 4 pounds DDT
1 gallon Xylene
½ pint Triton X-100

= 35% DDT concentrate

(2) 125 pounds DDT
31.5 gallons Xylene
2 gallons Triton X-100

= 35% DDT concentrate

3. Dust

The 10% DDT dust has been sent into the field primarily for

δ. Σκόνη

Ἡ 10% σκόνη DDT ἀποστέλλη πρὸς ἐπιτόπιον χρῆσιν, κυρίως διὰ τὴν καταπολέμησιν τῶν φορέων. Ἐὰν καθίστανται ἀναγκαία ἡ χρῆσις αὐτοῦ τοῦ ὑλικοῦ πρὸς καταπολέμησιν τῶν κωνώπων, δύναται τοῦτο νὰ ἁραιωθῇ περαιτέρω πρὸς σχηματισμὸν μίγματος 1% διὰ προσθήκης φορέως τινὸς ὅπως ἡ λεπτὴ κόνις τῶν ὀρόφων ἢ κιμωλία εἴτε ἄλευρον ἀκατάλληλον πρὸς βρῶσιν. (Ἄχρηστος δὲν πρέπει νὰ χρησιμοποιεῖται). Πρὸς σχηματισμὸν μίγματος 1% προσθέσατε ἕνα μέρος κόνεως 10% εἰς 9 μέρη ἁραιωτικοῦ. Κατὰ τὴν ἁραίωσιν 10% DDT (ἀντιφθειρικῆς κόνεως) πρὸς χρῆσιν ὡς 1% ἀντιπρωκτικῶν τῶν κωνώπων, πρέπει νὰ λαμβάνεται φροντίς, ὥστε νὰ ἐξακριβώνεται ὅτι τὸ προϊὸν μίγνυται τελείως ἐπὶ 20 ἕως 30 λεπτά, ἵνα ἐπιταχύνωμεν ὁμοιόμορφον κατανερισμὸν τοῦ DDT. Διὰ τὴν μίξιν μεγάλων ποσοτήτων ἀπαιτεῖται μικτὴρ σκυροδέματος, μικτὴρ ἀλεύρου εἴτε ἄλλη μηχανικὴ ἀντικατάστασις. Ὁ τύπος διαγωνιακοῦ βυτίου πρὸς μίξιν πρασίνου τῶν Παρισίων (μὲ ῥάβδον διερχομένην διὰ τῶν ἄξονων) δύναται νὰ χρησιμοποιηθῇ ἐπὶ τόπου δι' ἐργασίας μικρᾶς κλίμακος.

Γ. Μέθοδοι μίξεως

Τὸ DDT διαλύεται βραδέως εἰς τὸ καθαρὸν πετρέλαιον καὶ δύναται νὰ ἀναταράξῃ 24 ὥρας κατ' ἰσχυρὰν ἀνατάραξιν, ἵνα πληρῶς ἐνδιαλύσει. Εἶναι εὐκτέον ν' ἀναμιγνύεται τὸ DDT διὰ μηχανικῶν μέσων καὶ ν' ἀποστέλλεται ἐπὶ τόπου ὡς συμπεπυκνωμένον διάλυμα 20% ἕως 40% εἰς Ξυλένιον, Velsicol ἢ εἰς ἄλλον τινὰ καλὸν διαλύτην, τὸ ὁποῖον δύναται νὰ διαλυθῇ κατ' οἱονδήποτε ἐπιθυμητὸν τρόπον εἰς καθαρὸν πετρέλαιον εἴτε, ἐὰν προστεθῇ γαλακτωματικόν τι, εἰς ὕδωρ.

louse control. If it becomes necessary to use some of this material for mosquito control purposes, it may be diluted further to a 1 per cent mixture by the addition of such carriers as fine road dust, soap-stone, or condemned flour. (Lime should not be used). For a one (1) per cent mixture, add one part of the 10% dust to 9 parts of diluent. In diluting a 10% DDT (louse powder) for use as a 1% mosquito larvicide, care should be taken to see that the product is thoroughly mixed from 20 to 30 minutes to insure uniform distribution of DDT. For mixing large quantities, a cement mixer, flour mixer or other mechanical equipment is desirable. The diagonical barrel type Paris Green mixer (with a rod through the ends) can be used in the field for small scale operations.

C. Mixing Methods

DDT is slowly soluble in kerosene and may require 24 hours with frequent stirring to get it in solution. It is desirable to mix DDT with mechanical mixers and send into the field as a 20 to 40 per cent concentrate solution, in xylene, velsicol or some other good solvent which can easily be diluted in any manner desired with refined kerosene; or, if an emulsifier is added, with water.

1. Hand Mixers

Several types of hand mixers have been used successfully in small operations. If only a small amount is needed, the simplest way to mix it would be to place the mixture in a steel

1. Χειροκίνητοι μιγαῆρες

Πολλοί τύποι χειροκινήτων μικτήρων ἐχρησιμοποιήθησαν ἐπιτυχῶς εἰς μικρᾶς ἐργασίας. Ἐάν ἀπαιτεῖται μόνον μικρά ποσότης, ὁ ἁπλούστερος τρόπος διά τήν μίξιν θά ἦτο νά τοποθετηθῇ τό μῖγμα ἐντός χαλυβδίνου βαρελίου, τό ὁποῖον νά κυλίεται ὑπό τόν ἥλιον ἤ ν'ἀναταράσσεται συχνά. Πρακτική καί χρήσιμος διάταξις διά συνήθη μίξιν μικρῶν ποσοτήτων συνίστανται ἐκ βαρελίου 210 λίτρων (εἴτε προτιμότερον ἐξ ἑνός μεγαλυτέρου οἰνοβαρελίου) ἐφημωσμένου ὁριζοντίως ἐπί λικνιστικῆς συσκευῆς καί ἐφοδιασμένου μέ λαβάς διά τόν λικνισμόν. Τά ὑλικά προστίθενται διά μεγάλης ὀπῆς μετά πάσσαλος εἰς τό ἄνω μέρος τοῦ βαρελίου, τό δέ μῖγμα ἀναταράσσεται διά παλινδρομικοῦ λικνισμοῦ.

2. Ἡμιαυτόματοι μικτῆρες

Πρός μίξιν DDT καί ἀλευρῶν διά συμπυκνώσεως 20 καί 3% εἰς μεγάλην κλίμακα μηχανική μικτική συσκευή θά χρησιμοποιηθῇ ἐν Ἀθήναις. Ἐξ' ὅσον διατίθεται καθαρόν καί ἀκάθαρτον πετρέλαιον εἰς τάς περιφερείας, ἑκάστη περιφέρεια θά παρασκευάσῃ τά ἴδια διαλύματα ψεκασμοῦ 5% εἰς καθαρόν καί ἀκάθαρτον πετρέλαιον, πρός ἐξοικονόμησιν μεταφορῶν.

V. ΧΡΗΣΙΣ

Α. Χρήσιμα μέσα

Ἐπί τοῦ παρόντος δέν ἔχομεν κατάλληλον χειροκίνητον μέσον, τό ὁποῖον θά ἠδύνατο νά διασκορπίσῃ τάς μικράς ποσότητας DDT αἱτινες ἀπαιτοῦνται ἀνά στρέμμα(10 γραμμάρια ἀνά στρέμμα). Λόγω τῆς πολύ μικρᾶς ποσότητος DDT ἥτις ἀπαιτεῖται, ὅπως ἐλέχθη ἀνά στρ. ἐπιφανείας, ἐφ'ἧς ἀναπτύσσονται κώνωπες, τά παλαιά καθιερωμένα ἀνθελωνοσιακά μέσα (ὅπως γυαλός ψεκαστήρ), τά προηγουμένως χρησιμοποιούμενα διά τήν ἐπίθεσιν σχετικῶς μεγάλων ποσοτήτων ὑλικοῦ,

drum and roll it in the sun or stir frequently. A practical and useful device, for routine mixing of small amounts, consists of a 55 gallon barrel (or a larger wine barrel would be better) mounted horizontally on rockers and provided with handles for rocking. Materials are added through a large bung hole on the upper side of the barrel, and the mixture is agitated by rocking the barrel back and forth. A spigot is added to the bottom of the barrel for emptying.

2. Mechanical Mixer

For mixing DDT and solvents for 20 and 35% concentrates on a large scale, the mechanical mixing plant in Athens will be used. Since kerosene and oil is available in the regions, each region will mix their own 5% kerosene spray in order to save on transportation.

V. APPLICATIONS

A. Useful equipment

At this time we do not have suitable hand equipment that will disperse the small amounts of DDT required per acre (0.1 pound to 43,560 sq. feet). Because of the minute quantity of DDT required to treat an acre of mosquito breeding surface, the old standard malaria control equipment (such as oil knapsack sprayers) previously used for applying relatively large amounts of material, is not suitable for the application of DDT. If the surface is covered with oil film, is not necessary to use DDT. However, it may be necessary,

δέν εἶναι κατάλληλα διά χρῆσιν DDT. Ἐάν ἡ ἐπιφάνεια καλύπτεται ὑπό λεπτοῦ στρώματος πετρελαίου δέν εἶναι ἀναγκαία ἡ χρῆσις DDT. Ἐν πάσῃ περιπτώσει, δυνατόν νά καταστῇ ἀναγκαῖον εἰς τινα θέατρα ἐργασίας νά χρησιμοποιηθοῦν τά γνωστά ἀνθελονοσιακά μέσα πρός μεγίστην ὠφέλειαν, μέχρις ὅτου διατεθοῦν καλά κατάλληλα μέσα, σχεδιαζόμενα εἰδικῶς διά DDT. Νέαι βελτιώσεις εἰς τά μέσα καί περισσότερον ἀποτελεσματικαί μέθοδοι χρήσεως δημιουργοῦνται ἀπό ἡμέρας εἰς ἡμέραν. Νέοι ὡς νέα μέσα καταστοῦν διαθέσιμα, θά λάβουν πρωτεραιότητα ἔναντι ἄλλων ἀνθελονοσιακῶν ἐφοδίων.

Λαμβανομένου ὑπ'ὄψιν ὅτι τό ψεκαστικόν ἐπί τόπου θά ἔχῃ ἐπαρκῆ μεταφορικά μέσα καί μερικά ἄλλα μέσα πρώτης ἀνάγκης διά τάς ἐργασίας τοῦ ἀνθελονοσιακοῦ ἀγῶνος, τά ἀκόλουθα εἴδη θέλουν ἀποδειχθῆ ἰδιαιτέρως χρήσιμα διά τήν χρησιμοποίησιν τοῦ DDT.

1. <u>Ψεκαστῆρες χειροκίνητοι</u>

α. Ὁ συνήθης οἰκιακός ψεκαστήρ τοῦ "φλίτ" διαφόρου διαστάσεως καί τύπων θέλει χρησιμεύσῃ διά περιωρισμένας ἀντιπρωτομικάς ἐργασίας.

β. Ὁ μεγάλος 2-4 λίτρων χειροκίνητος "ψεκαστήρ φλίτ" ὑπό πίεσιν (Mason Capital ἤ ὅμοιοι), συνιστᾶται διά <u>συνήθεις</u> χρήσεις διαλυμάτων 5% DDT ὡς ἀντιπρωτομικῶν τῶν κωνώπων. Οἱ ψεκαστῆρες οὗτοι συνδυάζουν τά πλεονεκτήματα ἑνός ψεκαστῆρος πεπιεσμένου ἀέρος μέ τήν ἀπόδοσιν τοῦ συνεχοῦς τύπου καί εἶναι ἰδιαιτέρως χρήσιμοι, ἐφοδιαζόμενοι μέ χονδράς, μέσας καί λεπτάς πρεστομίδας. Εἷς τύπος μετ' ἐνστωλτικῆς δικλείδος, ἐπιτρέπων συνεχῆ καί ὁμοιόμορφον ψεκασμόν, μετά τήν ἐπίτευξιν τῆς πιέσεως, διατίθεται ἤδη. Παρέχει λεπτόν ψεκασμόν, ἰσοδύναμον διά συνήθεις ἀντιπρωτομικάς ἐργασίας καί δύναται νά χρησιμοποιηθῇ διά <u>περιωρισμένον</u> ἔμμονον ψεκασμόν.

in some theatres of operation, to use this standard malaria control equipment to the best advantage until more desirable equipment, designed especially for DDT, becomes available. New developments in equipment and more effective methods of application are being made from day to day. As this new equipment becomes available, it will take first priority over other supplies for malaria control.

Assuming that the men in the field will have adequate transportation and a few other first essentials for malaria control operations, the following items will prove particularly useful in the distribution of DDT.

1. Hand Sprayers

a. The ordinary household "flit" gun, which comes in various sizes and types will be found useful for limited larvicidal operations.

b. The large (2-3 quart capacity) hand pressure "flit gun" (Hudson Capital, or equal), is recommended for the routine applications of 5% DDT solutions as a mosquito larvicide. These sprayers combine the advantages of a compressed air sprayer with the efficiency of the continuous type and are especially useful when provided with coarse, medium, and fine nozzles. A model with a release valve, allowing for continuous and uniform spray after the pressure has been obtained, is now being made available. It produces a fine spray, ideal for routine larvicidding operations and can be used for limited residual spraying.

γ. Οἱ μεγάλοι, 15 λίτρων ψεκαστῆρες πεπιεσμένου ἀέρος μέ ἀνοικτήν κεφαλήν, μεγάλως συνιστῶνται διά τόν ὀιασκορπισμόν τοῦ DDT ὡς ἐμμόνου ψεκασμοῦ οἰκιῶν, ἐφοδιαζόμενοι μέ τάς κατωτέρω προστομίδας. Ὁ ψεκαστήρ Eudeon Industrial κατέχει ἰδιότητας, αἵτινες τόν καθιστοῦν προτιμώτερον ἀπό μερικούς ἄλλους. Δύνανται νά χρησιμοποιηθοῦν, ἐάν ἐφοδιασθοῦν μέ εἰδικάς προστομίδας, ἐλαστικούς σωλῆνας ἀνθεκτικούς εἰς τό πετρέλαιον, παρεμβύσματα καί ροδέλας. Προστομίδες ἐπί τῶν ψεκαστήρων ἐβελτιώθησαν διά πρασθήκης πλακός ὑπῆς No. 2½ ἤ 3. Τά ἀσθενῆ σημεῖα τοῦ ψεκαστῆρος εὑρίσκονται εἰς τά παρεμβύσματα, τάς δικλεῖδας καί τόν ἐλαστικόν σωλῆνα. Πρέπει νά διατηροῦνται πάντοτε πρόχειρα ἀντιλλακτικά τῶν ἐξαρτημάτων τούτων. Ἐπιτρῖπτε ἰδιαιτέρως τήν "ροδέλαν" μεταξύ τοῦ κυλίνδρου τῆς ἀντλίας καί τῆς κλωκός ἐπικαλύψεως. Τό ἐξάρτημα τοῦτο φθείρεται συχνώτατα καί ἀπαιτεῖ ἀντικατάστασιν.

δ. Οἱ ψεκαστῆρες mysto (τύπος γυαλιοῦ) θά ἦτο δυνατόν νά καταστοῦν χρήσιμοι δι'αὐτήν τήν ἐργασίαν, ἐάν ἦτο δυνατόν νά ἐφοδιασθοῦν μέ παρεμβύσματα καί ροδέλες ἀνθεκτικάς εἰς τό πετρέλαιον.

2. Προστομίδες

Τό πλέον σημαντικόν ἐξάρτημα τοῦ ψεκαστῆρος εἶναι ἡ προστομίς. Εἶναι πολύ ἀναγκαία διά τήν ἐπιτυχῆ λειτουργίαν τῶν ψεκαστήρων· κατά συνέπειαν πολύ συνιστᾶται νά τηρῆται πρόχειρος ἐπαρκής προμήθεια προστομίδων. Αἱ "κατάλληλοι" προστομίδες παράγουν ρικνίδιον ψεκασμοῦ πλάτους 80° καί χρωτούμενοι εἰς ἀπόστασιν 0,45 μέτρ. ἀπό τοῦ τοίχου ἀφίουν πλάτος ψεκασμοῦ 0,60 - 0,75 μέτρων. Τοιοῦτος ἐπίπεδος, ρικνιδιορειδής ψεκασμός ἐνεργεῖ ὡς ψῆκτρα, καλύπτων τόν τοῖχον ὁμοιομόρφως καί ἀπαιτῶν τό ἐλάχιστον τῶν κινήσεων ἐκ μέρους τοῦ χειριστοῦ.

c. The large, 4 gallon, open head air pressure sprayers are highly recommended for the dispersal of DDT as residual house sprays when provided with the proper nozzles. The Hudson Industrial sprayer has features which make it more desirable than some of the others. They can be used if they are provided with special nozzles, oil resisting hose, washers and gaskets. Nozzles on the sprayers have been improved by adding a No. 2½ or 3 orifice plate.

The weak points of the sprayer are in the gaskets, the air check valves and the hose. Replacements for these parts must be kept on hand at all times. Watch particularly the gasket between the pump cylinder and the cover plate. This part wears out most frequently, and needs replacement.

d. The mysto sprayers (knapsack type) would be useful for this work if oil resisting washers and gaskets can be provided.

2. Nozzles

The most important part of the sprayer is the nozzles. It is very necessary for the successful operation of the sprayers; therefore, it is strongly recommended that an adequate supply of the nozzles be kept on hand. The "proper" nozzles produces a fan spray width of 80°; and when held 18 inches from the wall, gives a swath width of 24-30 inches. Such a flat, fan-shaped spray acts like a brush, covering the wall evenly and requiring a minimum of movement on the part of the operator.

3. Ἀεροπλάνα

Δέκα ἀεροπλάνα 220 H.P. Steerman PT - 17 διατίθενται, ἐφωδιασμένα μέ γεννητρίας διά τόν διασκορπισμόν διαλύσεως 20% DDT ὑπό μορφήν ὑπερμικρᾶς ἐξαερώσεως.

Β. Ἀναλογίαι

Τό ποσόν τοῦ χρησιμοποιουμένου DDT καί ὁ καταμερισμός αὐτοῦ εἶναι οἱ σημαίνοντες παράγοντες διά τάς δόσεις τοῦ DDT μᾶλλον ἤ τό συνολικόν ποσόν τοῦ μίγματος. Τό ποσόν τοῦ ἀραιωτικοῦ ἔχει σημασίαν μόνον, καθ'ὅσον ἐξασφαλίζει ὁμοιόμορφον καταμερισμόν τῆς δραστικῆς οὐσίας. Ὁ τύπος τῶν διαλύσεων θά ἐξαρτηθῆ ἐκ τοῦ τύπου τῶν χρησιμοποιουμένων μέσων καί τῆς ἐπιφανείας, ἥτις πρόκειται νά ψεκασθῆ. Διά τήν καταπολέμησιν τῶν προνυμφῶν τῶν κωνώπων 10 γραμμ. DDT ἀνά στρέμμα ἔχουν δώσει καλά ἀποτελέσματα, χρησιμοποιούμενα εἰς διάλυσιν πετρελαίου, γαλάκτωμα ὕδατος, ὡς θερμική ἀεροποίησις εἴτε ὡς σκόνη. Ἡ δόσις κυμαίνεται ἀπό 10 ἕως 50 γραμμάρια ἀνά στρέμμα ἀναλόγως τοῦ τύπου τῆς πρός ἐπεξεργασίαν ἐπιφανείας καί ἄλλων ἐπιτοπίων συνθηκῶν. Δι'ἔμμονον ψεκασμόν οἰκιῶν ἐπιτίθεται 1 ἕως 2 γραμμάρια DDT ἀνά τετραγωνικόν μέτρον ψεκαζομένης ἐπιφανείας.

Γ. Μέθοδοι

1. Ψεκασμός διά τῆς χειρός (δι'ἀντιπονηρικόν ἀγῶνα)

α. Χάρις εἰς τόν μικρόν ὄγκον διαλύματος DDT τόν ἀπαιτούμενον πρός ἐνταμακτόνον δράσιν, οἱ μικροί χειροκίνητοι ψεκασταῖρες ἀποδεικνύονται πολύ χρήσιμοι. Μία τῶν "καλυτέρων" μεθόδων τῆς ἐφαρμογῆς ψεκασμοῦ 5% διά τῆς χειρός διά συνήθη καταπολέμησιν τῶν προνυμφῶν φαίνεται νά εἶναι ἡ διά μικροῦ (χωρητικότητος 2-3 λίτρων) ψεκαστῆρος τῆς χειρός "ρλίτ" ὑπό πίεσιν ἀέρος.

Εἰς πολλάς περιπτώσεις, ἰδία δι'ἐργασίας μικρᾶς κλίμακος,

3. Airplanes

Ten 220 H.P. Stearman PT-17 airplanes are available and equipped with generators for the dispersal of a 20% DDT solution as a thermal aerosol.

B. Rate

The amount of DDT applied and the distribution are the important factors in DDT dosages rather than the total amount of mixture. The amount of diluent is important only in that it insures even distribution of the active ingredient. The type of equipment used and area to be treated will determine the type of dilutions to make. For mosquito larvae control, 0.1 pound DDT per acre (43,560 sq. feet) has given good results when applied in an oil solution, water emulsion, as a thermal aerosol, or as a dust. The dosage will vary from 0.1 to 0.5 pounds per acre according to the type area treated and other field conditions. For residual house spraying 100 to 200 mg. DDT is applied per square foot of surface treated.

C. Methods

1. Hand Spraying (for larvae control)

a. Due to the small volume of DDT solution required for insecticidal action, the small hand sprayers are proving very useful. One of the "best" methods of hand application of a 5% spray for routine mosquito larvicide seems to be the small (2-3 qt. capacity) air pressure type of hand "flit" gun.

In many circumstances, especially for small scale operations, when mosquito breeding is "spotty" or in isolated

ὅπου ἡ ἀνάπτυξις τῶν κωνώπων εἶναι "σποραδική" ἤ εἰς ἀπομεμονωμένας τοποθεσίας, θά ἦτο ἐξόχως εὐκταῖον νά φέρῃ μεθ'ἑαυτοῦ ὁ ὑγειονομοφύλαξ μικρόν χειροκίνητον ψεκαστῆρα (ὅπως καί τόν προνυμφοσυλλέκτην του) καί νά ψεκάζῃ τάς εἰδικάς ἑστίας ἀναπτύξεως κωνώπων, τάς ὁποίας ἤθελε διαπιστώσῃ. Αὐτή ἡ μέθοδος ἐργασίας θά εἶναι ταυτοχρόνως οἰκονομική καί ἀποτελεσματική. Τοῦτο, ὡς ἔμμονος ψεκασμός, θά εἶναι μία νέα ἐπίτευξις διά τήν καταπολέμησιν τῶν κωνώπων. Κατά τό παρελθόν οἱ ὑγειονομοφύλακες ὤφειλον νά ἐρευνοῦν μίαν περιοχήν καί ἀκολούθως νά "ἀναφέρουν" τάς ἑστίας ἀναπτύξεως τῶν κωνώπων. Τότε αἱ περιοχαί αὗται ἔπρεπε νά ψεκασθοῦν ἤ ἐπικονιασθοῦν ὑπό συνεργείων ψεκασμοῦ ἤ ἐπικονιάσεως, τά ὁποῖα ἔφερον μεθ'ἑαυτῶν κουραστικά μέσα καί πιθανῶς ἐνήργουν εἰς ἄλλας τοποθεσίας μή ἀναπτυσσούσας κώνωπας καί νά τούς διέφευγον ἄλλαι, αἱ ὁποῖαι εἶχον ἀναφερθῆ.

Διά συνήθεις ἀντιφονυμφικάς χρήσεις ἐνδείκνυται νά φέρεται τό DDT ἐπί τόπου τῆς ἐργασίας ὡς συμπεπυκνωμένον γαλάκτωμα 35% καί νά ἀραιώνεται μέ ὕδωρ πρός σχηματισμόν τῆς συνιστωμένης διαλύσεως 5% πρός ψεκασμόν, ὡς αὐτή ἀπαιτεῖται. Τοῦτο συνεπάγεται τεραστίαν οἰκονομίαν εἰς τάς μεταφοράς. Ἐάν τό συμπεπυκνωμένον τοῦτο γαλάκτωμα φέρεται ἐπί τόπου ἐντός βαρελίων ἐφωδιασμένων μέ στρόφιγγας, θά ἦτο εὔκολον νά γεμίζωνται μικρά φιαλίδια καί φιάλαι καί νά φέρωνται ὑπό τῶν χειριστῶν, τῶν ἐκτελούντων τάς συνήθεις ἐργασίας. Ἐπί παραδείγματι, ἐάν ὁ ψεκαστήρ εἶναι χωρητικότητος 1 λίτρου, προστίθεται εἰς τόν ψεκαστῆρα τό περιεχόμενον φιαλιδίου ἤ φιάλης 150 γραμμαρίων γαλακτώματος 35% DDT ὅστις τότε πληροῦται βυθιζόμενος εἰς τό ὕδωρ. Τοῦτο ἀποτελεῖ 1 λίτρον διαλύσεως ψεκασμοῦ 5% ἐπαρκοῦς νά καλύψῃ 4 στρέμματα ἐπιφανείας ὕδατος, ἀναπτύσσοντος κώνωπας.

places, it will be highly desirable to have the mosquito inspector take along a small hand sprayer (as well as his dipper) and treat the specific spots where mosquito breeding is found. This method of treatment will be both economical and efficient. This, like residual spraying, will be a new approach to mosquito control. In the past, mosquito inspectors would "dip" an area and then "report" the location of mosquito breeding. Then the areas would be treated by oil or dusting crews who carried cumbersome equipment and probably treated some spots not producing mosquitoes and missed others that had been reported.

For routine larvicidal applications, it is suggested that DDT be carried to the field as a 35% DDT emulsion concentrate and diluted with water to make the recommended 5% spray solution as it is needed. This results in considerable saving in transportation. If this emulsion concentrate is carried to the field in drums provided with spigots, small vials or bottles may be easily refilled and carried by the operators making the routine applications. For example, if the sprayer is of one (1) quart capacity, a 5 ounce vial or bottle of the 35% DDT emulsion is added to the sprayer which is then filled by dipping in water. This makes 1 quart of 5% spray solution; enough to cover one acre (43,560 sq. feet) of mosquito breeding water surface.

If a 5% <u>oil solution</u> is used, it is suggested that it be carried to the field mixed ready for spraying, in drums provided

Ἐάν χρησιμοποιῆται διάλυμα 5%, ὑποδεικνύεται νά φέρεται εἰς τό ὕπαιθρον μεμιγμένον ἕτοιμον πρός ψεκασμόν ἐντός βαρελίων, ἐφοδιασμένων μέ στρόφιγγας. Εἰς αὐτήν τήν περίπτωσιν θά καθίσταται ἀναγκαῖον νά ἐπανέρχεται ὁ χειριστής εἰς τό βαρέλιον ἑκάστην φοράν πού ἐπιθυμεῖ νά ἐπαναπληρώσῃ τόν ψεκαστῆρα του. Ψεκάστε κατ'ἀναλογίαν ἑνός ἐμβολισμοῦ κατά τετραγ. μέτρον ἐπιφανείας ὕδατος, ἀναπτυσσούσης κώνωπας.

β. Ἐάν εἶναι ἀναγκαῖον νά χρησιμοποιοῦνται ψεκαστῆρες μέ ἀνοικτήν κεφαλήν καί πίεσιν ἀέρος χωρητικότητος 15 λίτρων εἴτε οἱ γυλιοί ψεκαστῆρες δι'ἀντιπρονυμφικήν ἐργασίαν, ἡ διάλυσις θά ἔπρεπε νά ἀραιωθῇ εἰς 1% καί νά ψεκασθῇ κατ'ἀναλογίαν 1,25 λίτρων ἀνά στρέμμα. Ἡ μεταφορά 99% πετρελαίου ἤ ὕδατος διά μέσου τῆς λάσκης καί τοῦ βορβόρου, μέ μόνον 1% τοξικοῦ DDT ἐντός ψεκαστῆρος αὐτοῦ τοῦ τύπου ἀποτελεῖ κουραστικήν καί ἀνεπιθύμητον μέθοδον καταμερισμοῦ διά καταπολέμησιν τῶν προνυμφῶν. Αὐτοί οἱ ψεκαστῆρες ἔχουν ἐπίσης τοξικόν κίνδυνον ἐκ διαρυγῶν πετρελαιοειδῶν διαλυμάτων DDT ἐπί τῆς ράχεως χειριστοῦ. Ὁ τύπος τῆς πρός ψεκασμόν θέσεως θά καθορίσῃ τήν πρός χρῆσιν καλυτέρων μέθοδον.

γ. Ἄν καί ἡ σχόνη DDT εἶναι 10 ἕως 100 φοράς τοξικωτέρα διά τάς προνύμφας τῶν κωνώπων ἀπό τό Πράσινον τῶν Παρισίων, γενικῶς δέν εἶναι πρακτικόν νά χρησιμοποιῆται, ἀφ'ὅτου εὑρέθη ὅτι ψεκασμός διαλύσεως εἰς πετρέλαιον ἤ γαλακτώματος εἰς ὕδωρ εἶναι πάρα πολύ προτιμώτερος. Ἡ μεγίστη χρῆσις τοῦ DDT ὡς κόνεως 10% γίνεται διά τήν καταπολέμησιν τῶν φθειρῶν καί δέν θά ἔπρεπε νά χρησιμοποιῆται διά τήν καταπολέμησιν τῶν κωνώπων, ἐφόσον παρέχωνται προτιμώτεραι μορφαί DDT. Ἐν πάσῃ περιπτώσει, ἐφόσον ἡ ἀνάγκη τό ἀπαιτεῖ, ἡ κόνις 10% δύναται νά ἀραιωθῇ εἰς 1% καί νά χρησιμοποιηθῇ δι'ἑνός συνήθους χειροκινήτου φυσητῆρος Πρασίνου τῶν Παρισίων κατ'ἀναλογίαν 1 χιλιογράμμου

with spigots. In this case it will be necessary for the operator to return to the drum each time that he wishes to refill his sprayer. Treat at rate of one stroke per square yard of mosquito breeding water surface.

b. If it becomes necessary to use the 4 gallon open head air pressure sprayers or the knapsack sprayers for larvicidal work, the solution should be diluted to 1% and applied at the rate of 5 quarts per acre. To carry 99% oil, or water, through mud and muck with only 1% of the toxic DDT in a sprayer of this type makes it a cumbersome and undesirable method of distribution for larvae control. These sprayers also possess the toxic hazard of leaking DDT oil solutions on the back of the operator. The type of place to spray will determine the best method to use.

c. Although DDT dust is 10 to 100 times as toxic to mosquito larvae as Paris Green, in general, it is not practical to use it since an oil solution or water emulsion spray has been found to be much more desirable. DDT's greatest use as a 10% powder is for the control of lice and should not be used for mosquito control purposes when other more desirable forms of DDT are available. However, if necessity demands it, the 10% dust may be diluted to 1% and applied with an ordinary Paris Green hand duster at the rate of 10 pounds per acre which equals 0.1 pound pure DDT per acre.

d. Drip cans, plaster of Paris covered DDT "eggs", bombs and hand grenades filled with DDT, have been tested. DDT has no magic

ἀνά στρέμμα, ὅπερ ἀντιστοιχεῖ πρός 10 γραμμάρια καθαροῦ DDT κατά στρέμμα.

δ. Στάζοντα δοχεῖα "ταφά" DDT κεκαλυμμένα μέ γύψον τῶν Παρισίων, ρόμβαι καί χειροβομβίδες πλήρεις DDT ἔχουν δοκιμασθῆ. Τό DDT δέν ἔχει τήν μαγικήν δύναμιν τῆς αὐτομάτου διασπορᾶς ἐπί τῶν ἐπιφανειῶν τοῦ ὕδατος καί κατά τήν διασπορᾶν αὐτῆς τῆς μικρᾶς ποσότητος ὑλικοῦ πρέπει νά δίδεται μεγάλη προσοχή, οὕτως ὥστε νά διαπιστώνεται ὅτι ἐπεξετάθη ἐφ' ὁλοκλήρου τῆς ἐπιφανείας καί ἰδία ὅπου σχεδίαι ἐξ ἐπιπλεόντων ἀντικειμένων θά τοῦ ἀπέκοπτον τήν ὁδόν πρός τάς ἀποκεκλεισμένας περιοχάς, ὅπου ἡ ἀνάπτυξις τῶν κωνώπων πιθανόν νά εἶναι ἔντονος. Προστίθενται ἀλλοβλέπουσαι εἰς τήν ἐπίθεσιν τοῦ DDT εἰς τό ὕδωρ τῶν ἀρδεύσεων εἰς τήν πηγήν του δέν ὑπῆρξαν ἰδιαζόντως ἐπιτυχεῖς.

Αἱ μέθοδοι αὗται χρησιμοποιήσεως τοῦ DDT δέν συνιστῶνται διά συνήθεις ἐργασίας καταπολεμήσεως τῶν κωνώπων λόγω:

1. τοῦ χρόνου καί τῶν δαπανῶν, αἵτινες ἀπαιτοῦνται διά τήν προπαρασκευήν,
2. τῆς ἀνικανότητος πρός ἐφαρμογήν τῆς καταλλήλου δόσεως εἰς τάς καταλλήλους τοποθεσίας καί
3. τῆς περιωρισμένης ἐκτάσεως, ἥτις δύναται νά ἐπηρεασθῆ.

2. Ἔμμονος ψεκασμός (διά τήν καταπολέμησιν τῶν τελείων ἐντόμων)

Ἐπιτοπίους ἐργασίας τό συμπεπυκνωμένον DDT φέρεται εἰς τό μέρος τοῦ ψεκασμοῦ ἐντός βαρελίων πετρελαίου 210 λίτρων εἴτε ἐντός δοχείων τῶν 19 λίτρων, ἀναλόγως τῆς ἐκτάσεως τῶν ἐργασιῶν. Τό συμπεπυκνωμένον γαλάκτωμα 35% παρέχει μεγάλην οἰκονομίαν εἰς χῶρον μεταφορᾶς. Χειροκίνητοι ψεκαστῆρες τῆς Hudson Industrial ἤ ὁ στρατιωτικός τύπος ἀπολυμάνσεως ἔχοντες περιεκτικότητα 15 λίτρων θέλουσι καινῆς χρησιμοποιηθῆ δι'

powers of spreading itself over water surfaces and in dispersing this small amount of material, great care must be taken to see that it is introduced onto the entire surface, particularly where there are rafts of floatage that will cut its access to sheltered areas where breeding may be intense. Trials involving the addition of DDT to irrigation water at its source have not been particularly successful.

These methods of DDT application are not recommended for routine mosquito control operations because of

1. the time and cost required for preparation;
2. the inability to apply the proper dosage at the proper places; and
3. the limited area that will be affected.

2. Residual Spraying (for Adult Control)

For field operations the DDT concentrate is carried to the project site in 55 gallon oil drums or in 5 gallon cans, depending upon the extent of the operations. The 35% emulsion concentrate affords a great saving in transportation space. Hand sprayers of the Hudson Industrial or Army decontamination type having a 4 gallon capacity will be commonly used for residual house spraying, until more desirable "inventions" become available.

One part of the concentrate is placed in the sprayer and 6 parts of water added. Marking the proper level in the sprayer will avoid the necessity for measuring out 6 parts of water each time the tank is refilled. This is best done by soldering pieces of wire on the

ἔμμονον ψεκασμόν οἰκιῶν, μέχρις ὅτου καταστοῦν διαθέσιμοι περισσότερον κατάλληλοι "ἐφευρέσεις".

'Εντός τοῦ ψεκαστῆρος τίθεται ἕνα μέρος συμπυκνώσεως καί προστίθενται 6 μέρη ὕδατος. Σημειώνοντες τήν ἁρμοδίαν στάθμην ἐντός τοῦ ψεκαστῆρος θέλομεν ἀποφύγη τήν ἀνάγκην μετρήσεως 6 μερῶν ὕδατος ἑκάστην φοράν ἀναπληρώσεως τοῦ δοχείου. Τοῦτο ἐπιτυγχάνεται καλύτερον διά συγκολλήσεως τεμαχίων σύρματος εἰς τό ἐσωτερικόν τῶν ψεκαστήρων. 'Αφοῦ τοποθετηθῆ τό κάλυμμα, τό δοχεῖον ἀναστρέφεται πολλάκις ἵνα ἐξασφαλισθῆ ἡ τελεία μῖξις. 'Η πίεσις τοῦ ἀέρος ἀνυψοῦται διά 50 ἕως 60 περίπου ἐμβολισμῶν τῆς ἀεραντλίας καί τό γαλάκτωμα ψεκασμοῦ 5% εἶναι ἕτοιμον πρός χρησιμοποίησιν δι'ἔμμονον ψεκασμόν οἰκιῶν. 'Ο χειριστής δύναται νά πραγματοποιήση ψεκασμόν 18 τετρ. μέτρων κατά λεπτόν, χρησιμοποιῶν κατί τι ὀλιγώτερον τοῦ 1 λίτρου διαλύματος ψεκασμοῦ. ('Η προστομίς Νο. 1/4 T 8002 παρέχει 757 κυβ. ἑκ. ἀνά λεπτόν ὑπό πίεσιν 40 λιβρῶν, ποσότητα ἐπαρκῆ πρός ψεκασμόν 18 τετρ. ποδῶν μέ ἀναλογίαν 2 γραμμαρίων DDT κατά τετρ. μέτρον.Κρατήσατε τήν προστομίδα περίπου 45 ἑκατοστά ἀπό τοῦ τοίχου. 'Αρχίσατε ἀπό τήν γωνίαν τοῦ δαπέδου, κινεῖτε τόν ψεκασμόν πρός τά ἄνω κατά κατακόρυφον γραμμήν, μέχρις ὅτου φθάση τήν κορυφήν. Παρακολουθεῖτε τό ἴχνος τοῦ ψεκασμοῦ καί κινεῖτε ὁμοιομόρφως καί σταθερῶς τοῦτο ὡς εὐθύγραμμον σκούπισμα. Μήν ἀφήνετε ἀψεκάστους περιοχάς καί μή ψεκάζετε ἐξαιρετικῶς μεμονωμένας τοιαύτας. Κατά τάς πρακτικάς ἐπιτοπίους ἐργασίας οἱ χειρισταί ψεκάζουν τούς τοίχους μέχρις ὅτου καταστοῦν "ὑγροί", οὐχί ὅμως ἐξαιρετικῶς, οὕτως ὥστε νά ἀπορρέουν. Συνεργεῖον ψεκασμοῦ ἐκ δύο ἀνδρῶν δύναται νά ψεκάση περίπου 20 οἰκίας καθ'ἡμέραν. Ψεκάσατε ὅλας τάς θέσεις, μετά τῶν ὁποίων οἱ κώνωπες πιθανόν νά ἔλθουν εἰς ἐπαφήν.

insides of the sprayers. After the cover is replaced, the tank is inverted several times to insure thorough mixing; the air pressure is brought up to approximately 50 pounds by 60 strokes of the air pump and the 5% water emulsion spray is ready for application as a residual house spray. The operator will practice spraying 190 sq. ft. per minute using slightly less than 1 quart of spray solution. (Nozzle No. 4T8002 discharges 757 c.c. per minute at 40 pounds pressure, enough to spray 190 sq. ft. at the rate of 200 mg. per sq. ft.) Hold the nozzle about 18" from the wall. Begin at the bottom corner, move the spray upward in a vertical line until the top is reached. Watch the spray pattern and move the spray evenly and steadily in a straight sweep the width of the spray pattern. Do not leave dry spots nor spray one spot excessively. In making practical field applications the operators sprayethe walls until "wet" but not to excess run off. A two man spraying crew will do about 20 houses per day. Spray all places that mosquitoes are likely to touch. Food and water, left open in the kitchen, is covered with a cloth or paper.

Screens are most economically treated by painting the solution on with a paint brush.

Residual house spraying meets enthusiastic approval of the inhabitants of an endemic area. The morale effect is tremendous and should not be overlooked.

A good job of village spraying gets rid of all flies, fleas, lice, bedbugs, roaches and mosquitoes. The inhabitants will be glad to do the work if they are approached properly and given accurate

Τρόφιμα ἢ ὕδωρ ἐκτεθειμένα εἰς τὸ μαγειρεῖον, καλύπτονται μέ ἕνα παχύ ἢ χαρτί.

Τά ἀντικωνωπικά πλέγματα εἶναι οἰκονομικώτερον νά ἐπιχρίωνται μέ διάλυσιν διά πινέλου.

Ὁ ἐμπνεύς ψεκασμός οἰκιῶν συναντᾶ ἐνθουσιώδη ἀκόλουθίαν ἐκ μέρους τῶν κατοίκων τῶν ἐνύπνιων περιοχῶν. Τό ἠθικόν ἀποτέλεσμα εἶναι τεράστιον καί δέν πρέπει νά παραβλέπεται.

Μία καλή ἐργασία ψεκασμοῦ χωρίων τά ἀπαλλάσσει ἀπό ὅλες τίς μυῖγες, ψύλλους, ψείρες, κατσαρίδες καί κώνωπας. Οἱ κάτοικοι εὐχαρίστως θέλουν ἐκτελέσει τήν ἐργασίαν, ἐάν γίνῃ κατάλληλος προσέγγισις καί τούς δοθοῦν ἀκριβεῖς ὁδηγίες.

3. Ἀεροπλάνου

α. Θερμικαί ἐξαερώσεις

1. Μία προσπάθειαν ἐξοπλισμοῦ τοῦ καί πρός ἐπίτευξιν λεπτοτέρας διασπάσεως τῶν διαλυμάτων ἀπό ἐκείνης, ἥτις ἦτο δυνατόν νά ἐπιτευχθῇ δι'ἀεροπλάνου μετά ψεκαστικῆς συσκευῆς, ἐστράφη ἡ προσοχή πρός τήν χρῆσιν συσκευῶν καυστηρίων πρός παραγωγήν θερμικῶν ἐξαερώσεων δι'ἐκτοξεύσεως διαλύματος 20% DDT εἰς Velsicol NM-70 ἐντός τοῦ ὑωλῆνος ἐξαγωγῆς τῶν καυστηρίων τοῦ ἀεροπλάνου. Μία πολύ ἱκανοποιητική μέθοδος ἀνεπτύχθη πρός παραγωγήν ἐξαερώσεως μέ 90% τῶν σταγονιδίων διαμέτρου ἀπό 5 ἕως 100 μικρῶν. Μικρῶν ποσοτῶν ἐκ τοῦ ὑλικοῦ ἔχει τάς διαστάσεις τῶν μορίων τοῦ καπνοῦ καί τό νέφος τῆς ἐξαερώσεως εἶναι ὁρατόν ὁράτων. Ἡ ἐξαέρωσις φέρεται ταχέως πρός τήν ἐπιφάνειαν τοῦ ὕδατος ὑπό καταρχομένου ρεύματος ἐκ τοῦ ἕλικος τοῦ ἀεροπλάνου. Ἡ βλάστησις διασπᾶται πολύ ἀποτελεσματικῶς. Καταστροφαί προνυμφῶν 90% καί ἀνώτεραι

and detail instructions.

3. Airplane

a. Thermal Aerosols

1. In an effort to atomize the DDT and to obtain a finer breakup of solutions than could be obtained with airplane spraying equipment, attention was turned toward the use of exhaust generators to produce thermal aerosols by injecting a 20% DDT - Velsicol NR-70 solution into the exhaust manifold of the airplane. A very satisfactory method has been developed for producing an aerosol with 90% of the droplets with diameters in the 5 to 100 micron range. A small percentage of the material is in the size range of smoke particles and the aerosol cloud produced is quite visible. The aerosol is rapidly carried to the water surface by the down draft from the airplane propeller. Vegetation is penetrated very effectively. Larval kills of 90% or better have been obtained with this unit over swaths as wide as 300 feet at actual treatment rates as low as 0.04 lbs. DDT per acre. When DDT thermal aerosol are distributed at the rate of 0.5 pounds per acre it is effective as a mosquito adulticide. It not only kills them in their diurnal resting shelters, but will form a residue on the vegetation and will kill newly emerged mosquitoes when they touch the DDT residual particles.

2. The Stearman PT-17, 220 H.P. aircraft are available and equipped with thermal aerosol generators for use in malaria control

ἐπετεύχθησαν δι'ειδικῆς τῆς συσκευῆς ὑπέρ πλάτη ψεκασμοῦ φθάνοντα τά 100 μέτρα μέ πραγματικήν ἀναλογίαν χρήσεως τόσον χαμηλάς, ὅσας 4 γραμμάρια ἀνά στρέμμα. Ἐάν ἡ θερμική ἐξάερωσις τοῦ DDT κατανεμηθῆ κατ'ἀναλογίαν 50 γραμμαρίων κατά στρέμμα εἶναι ἀποτελεσματική καί ἐναντίον τῶν τελείων κωνώπων. Δέν φονεύει τούτους μόνον εἰς τά καταφύγια τῆς ἡμερησίας των ἀναπαύσεως, ἀλλά σχηματίζει καί ὑπόλειμμα ἐπί τῆς βλαστήσεως καί θά φονεύη νεωστί ἐκκολευθέντας κώνωπας, ὅταν θά ἔρχωνται εἰς ἐπαφήν μέ τά ἐμμένοντα μόρια τοῦ DDT.

2. Τά ἀεροπλάνα Stearman PT-17, 220 H.P. εἶναι διαθέσιμα καί ἐχοδιασμένα μέ γεννητρίας θερμικῆς ἐξαερώσεως πρός χρῆσιν δι'ἀνθελονοσιακάς ἐργασίας. Ἡ μέθοδος αὕτη διασπορᾶς τοῦ DDT δι'ἀεροπλάνου ἀποτελεῖ τήν τελευταίαν καί πλέον οὐσιώδη τελειοποίησιν διά τήν καταπολέμησιν τῶν προνυμφῶν τῶν κωνώπων. Ἀποτελεῖ τόν μοναδικόν τύπον συσκευῆς, ὅστις ἀνεπτύχθη, ἵνα διασπείρη τάς ἀπαιτουμένας μικράς ποσότητας DDT ἀνά στρέμμα. Αὐτή ἡ μέθοδος χρήσεως καθιστᾶ δυνατήν τήν καταπολέμησιν εἰς μεγάλα ἔλη καί ἐστιῶν ἀναπτύξεως κωνώπων, αἱ ὁποῖαι κατά τό παρελθόν ἦτο ἀδύνατον νά προσπελασθοῦν καί καταπολεμηθοῦν διά τῶν μεθόδων τῶν χειρῶν. Εἰς ὅλας τάς πρακτικάς περιπτώσεις ἓν ἀεροπλάνον δύναται νά ἐκτελέση περισσότερον ὁλοκληρωμένον ἔργον ἐντός ὀλίγων λεπτῶν ἀπό ἐκεῖνο, τό ὁποῖον δύναται νά ἐκτελέση ἐπίγειον συνεργεῖον ἐπί πολλάς ἡμέρας. Ὁπωσδήποτε, διά πολύ περιωρισμένας ἐργασίας εἴτε διά τήν καταπολέμησιν μικρῶν μεμονωμένων ἐστιῶν ἀναπτύξεως κωνώπων (πολυαρίθμων ἐν Ἑλλάδι), μέθοδοι χρήσεως διά τῆς χειρός εἶναι πρακτικώτεραι, οἰκονομικώτεραι καί πρέπει νά

operations. This method of DDT distribution by aircraft is the latest and most sensational development in mosquito larvae control. It is the only type of equipment that has been developed that will distribute the small amounts of DDT required per acre. This method of application makes it possible to control large swamps and mosquito breeding places that in the past have been inaccessible and impossible to control by hand methods. In practically all situations a plane can do a more thorough job in a few minutes than a ground crew can do in several days. However, for very limited operations or for treatment of small isolated breeding spots (numerous in Greece), hand methods of application are more practical, economical, and must be carried on diligently in order to eliminate some of the worst malaria producing spots.

b. Flying Techniques

1. The pilot is a key man and has been specially trained for this type of flying. The success of the airplane work depends on his attitude, his knowledge of mosquito biology, and his thorough understanding of all aspects of the problem. He holds the stick and the success of the operation in his hand.

2. A few hours in the early morning (break of dawn) affords the best flying weather for this type of work. When the wind is blowing it is difficult to deposit the solution on the proper places. The flight should not be lower than 20 feet from the surface of the water.

ἐφαρμόζωνται εὐφυῶς πρὸς περιορισμὸν μεριμνῶν ἐκ τῶν χειρίστων ἐστιῶν ἀναπτύξεως ἐλονοσίας.

β. Τεχνικὴ τῆς πτήσεως

1. Ὁ πιλότος εἶναι ὁ κύριος παράγων καὶ ἐξαιρετικῶς εἰς αὐτὸν τὸν τύπον πτήσεως. Ἡ ἐπιτυχία τοῦ ἔργου τοῦ ἀεροπλάνου ἐξαρτᾶται ἐκ τῆς στάσεώς του, τῶν γνώσεών του ἐπὶ τῆς βιολογίας τῶν κωνώπων καὶ τῆς τελείας κατανοήσεως ὅλων τῶν ἀπόψεων τοῦ προβλήματος. Κρατεῖ τὸ κηδάλιον καὶ τὴν ἐπιτυχίαν τῶν ἐργασιῶν εἰς τὰς χεῖρας του.

2. Ὀλίγαι ὧραι ἐνωρὶς τὴν πρωΐαν (αὐγή) παρέχουν τὸν κάλλιστον καιρὸν δι'αὐτὸ τὸ εἶδος τῆς ἐργασίας. Ὅταν πνέῃ ἄνεμος εἶναι δύσκολον νὰ ἐκπροτεθῇ τὸ διάλυμα εἰς τὰς καταλλήλους θέσεις. Ἡ πτήσις δὲν θὰ ἔπρεπε νὰ εἶναι χαμηλοτέρα τῶν 6 μέτρων ἀπὸ τῆς ἐπιφανείας τοῦ ὕδατος.

Ἡ προμήθεια καὶ ὁ ἐξοπλισμὸς τῶν ἀεροπλάνων ἐγένετο μὲ τεραστίας δαπάνας πρὸς ἐκτέλεσιν εἰδικοῦ ἔργου ἐν Ἑλλάδι. Ἕκαστος ὀφείλει νὰ μεριμνᾷ καὶ νὰ ἐξακριβώνει ὅτι ἐκτελοῦν τὸ ἔργον τοῦτο καλῶς. Τὸ κόστος ἀνὰ στρ. ψεκασθέντος ἐδάφους ἀναπτύσσοντες κώνωπας θὰ εἶναι οἰκονομικώτερον καὶ τὸ ἔργον περισσότερον ἀποτελεσματικὸν ἂν ἐψεκάζετο διὰ μεθόδων τῆς χειρός.

VI. ΠΡΟΦΥΛΑΞΕΙΣ ΚΑΤΑ ΤΗΝ ΧΡΗΣΙΝ ΤΟΥ DDT

1. Τὸ DDT εἶναι ἐξόχως τοξικὸν διὰ τὰ ἔντομα εἰς μικροτάτας ποσότητας, ἀλλ'ἐλαφρᾶς μόνον εἰς τὸν ἄνθρωπον καὶ τὰ ζῶα. Τὸ DDT δὲν θέλει προκαλέσῃ σοβαρὰς βλάβας εἰς τὸν ἄνθρωπον, ἐὰν χρησιμοποιηθῇ προσεκτικῶς καὶ ληφθοῦν αἱ καταλλήλοι προφυλάξεις. Ὡς σκόνη δὲν εἶναι

The planes have been procured and equipped at considerable cost to do a special job for Greece. Everyone must take care to see that they do this job well. The cost per acre of mosquito breeding grounds treated will be more economical and efficient than if it is treated by hand methods.

VI. CAUTIONS IN THE USE OF DDT

1. DDT is highly toxic to insects in minute quantities but only slightly toxic to man and animals. DDT should not cause serious damage to man when carefully used and the proper precautions taken. As a powder, it is not toxic to the skin and not so much so when taken internally; but in oil solutions, it is often toxic to the skin and very toxic when taken internally. The oil solution is absorbed through the skin and prolonged exposure and continuous contact (with a leaky knapsack sprayer, for example) should be avoided. When such contact is made, wash it off with soap and water.

2. After using DDT in a water emulsion, the sprayers and nozzles should be cleaned with hot soap and water or an oil solution, as the water emulsion (even with fresh water) tends to rust the equipment.

3. If too high a concentration of DDT is applied (more than 1 part to 10 million parts of water, or as much as 1 pound per acre), it may kill fish and other wild life.

4. Careful entomological studies and observations should be made before making indiscriminate, wide scale applications of DDT to

areas where honey bees, silkworms, or other useful insects might be killed. In many places, however, it may become desirable to use DDT for the control of various insect pests which cause millions of dollars worth of damage to agriculture (the olive fly for example).

5. DDT is not a "cure all" for mosquito control. Other appropriate standard methods and precautions will have to be employed according to the circumstances. For example, DDT does not repel mosquitoes not kill quickly; therefore, pyrethrum sprays, bed nets, or repellents would furnish more protection to a traveler passing through an endemic area than DDT spraying. Drainage, house screening, and DDT spraying would be more desirable for permanent control.

6. In spite of its remarkable insecticidal properties, DDT is practically useless unless properly distributed over the area inhabited or frequented by the insect species for which control is desired. They must touch it.

προφύλαξιν εἰς ταξιδιώτην, διερχόμενον δι'ἐνδημικῆς περιοχῆς, ἀπό ψεκασμόν DDT. 'Αποστραγγίσεις, ἀντικωνωπικά πλέγματα οἰκιῶν καί ψεκασμοί DDT θά εἶναι περισσότερον ἐφικτέα διά μόνιμον καταπολέμησιν.

6. Παρά τάς ἀξιολόγους ἐντομοκτόνους ἰδιότητάς του τό DDT εἶναι πρακτικῶς ἄχρηστον ἐφόσον δέν κατανέμεται καταλλήλως ἐπί τῆς ἐκτάσεως τῆς κατοικουμένης καί συχναζομένης ὑπό τῶν εἰδῶν τῶν ἐντόμων, τῶν ὁποίων ἐπιδιώκεται ἡ καταπολέμησις. 'Οφείλουν νά ἔλθουν εἰς ἐπαφήν μέ αὐτό.

VII. ΠΕΡΙΛΗΨΙΣ

'Η ἀνακάλυψις τοῦ DDT ἔχει ἀνατρέψει τάς μεθόδους καταπολεμήσεως τῶν κωνώπων. Πολύ μικραί ποσότητες ἀπορροφώμεναι κατά τήν ἐπαφήν προκαλοῦν τόν θάνατον τῶν ἐντόμων κατά ἰδιάζοντα, φανταστικόν, φυσιολογικόν τρόπον καί ἐξακολουθοῦν νά φονεύουν ἐπί μακρόν χρόνον μετά τήν ἀρχικήν του ἐφαρμογήν. Χρησιμοποιεῖται εἰς ἀναλογίας ἀπό 10 ἕως 50 γραμμ. ἀνά στρέμμα ὡς ἀντιπρονυμφικόν καί ἀπό 1 ἕως 2 γραμμ. ἀνά τετραγ. μέτρον ὡς ἔμμονον ἐναντίον τῶν τελείων ἐντόμων. Ἔχει πλῆθος ἐφαρμογῶν καί εἶναι ἀποτελεσματικόν χρησιμοποιούμενον ὡς σκόνη, διάλυμα εἰς πετρέλαιον, γαλάκτωμα ὕδατος ἤ ὡς θερμική ἐξαέρωσις.

Μερικαί συσκευαί τῆς χειρός εὑρέθησαν χρήσιμοι διά τήν διασποράν τοῦ DDT ἀλλά ἡ νεωτάτη, πλέον οὐσιώδης καί ἀποτελεσματική διά τήν καταπολέμησιν τῶν προνυμφῶν μέθοδος εἶναι ἡ δι'ἀεροπλάνου ὑπό μορφήν θερμικῆς ἐξαερώσεως. Αὐτή ἡ μέθοδος ἐφαρμογῆς καθιστᾶ δυνατόν τόν ἀνθελονοσιακόν ἀγῶνα ἐπί εὐρέων ἐκτάσεων, αἵτινες κατά τό παρελθόν καθίσταντο ἀπροσπέλαστοι καί ἦτο ἀδύνατον νά ἐξυγιανθοῦν διά μεθόδων τῆς χειρός. 'Αποτελεῖ νέον ἐργαλεῖον τοῦ ἐξοπλισμοῦ τοῦ ἀνθελονοσιακοῦ ἀγῶνος καί θά λάβη ἐνεργόν μέρος εἰς τό ἔργον. Ἄλλαι μέθοδοι θέλουν χρησιμοποιηθῆ διά νά συμπληρώσουν τό ἔργον. Ἔμμονος ψεκασμός οἰκιῶν καί μέθοδοι χειρός πρός καταπολέμησιν τῶν προνυμφῶν εἶναι ἐξ ἴσου σημαντικαί. Ἄν καί πολλά ὑπολείπονται νά διδαχθῶμεν περί τοῦ DDT ἡ ἄμεσος χρησιμοποίησίς του διά τήν καταπολέμησιν τῶν ἐντόμων θά εἶναι ἔντονος καί ἐκτεταμένη, λαμβάνουσα προτεραιότητα ἔναντι ὅλων τῶν ἄλλων ἐντομοκτόνων.

VII. SUMMARY

The discovery of DDT has revolutionized mosquito control methods. Minute quantities absorbed upon contact causes death to insects in a peculiar, fantastic, physiological sort of way, and continues to kill for long periods of time after the original application. It is applied at rates from 0.1 to 0.5 pounds per acre as a larvicide and from 100 to 200 mg. per sq. ft. as an (residual) adulticide. It has a wide range of application and is effective when applied as a dust, an oil solution, a water emulsion, or as a thermal aerosol.

Certain hand equipment has been found useful in the distribution of DDT, but the newest, most sensational, and effective method for larvae control is by airplane as a thermal aerosol. This method of application makes malaria control possible in vast areas that, in the past, have been inaccessable and impossible to control by hand methods. It is a new tool in the malaria control equipment and will only do part of the job. Other methods will be used to make the job complete. Residual house spraying and hand methods for larvae control are equally important.

Although much remains to be learned about DDT, its immediate utilization for insect control should be prompt and widespread, taking priority over all other insecticides.

ΟΔΗΓΙΑΙ ΔΙΑ ΤΗΝ ΑΠΟΤΕΛΕΣΜΑΤΙΚΗΝ ΚΑΙ ΟΙΚΟΝΟΜΙΚΗΝ ΧΡΗΣΙΝ ΤΟΥ

ΚΑΤΑ ΤΗΝ ΧΡΗΣΙΜΟΠΟΙΗΣΙΝ ΤΟΥ ΥΠΟ ΙΔΙΩΤΩΝ

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1. ΤΟ DDT ΠΑΡΕΧΕΤΑΙ ΥΠΟ ΔΙΑΦΟΡΟΥΣ ΜΟΡΦΑΣ.

α. 100% καθαρόν DDT (λευκή, κολλώδης, κρυσταλλική ουσία. Δέν παρέχεται δι' οἰκιακήν χρῆσιν). Χρησιμοποιούμενον διά τήν παρασκευήν ὑγρῶν διαλυμάτων πρός ψεκασμόν.

β. 10% DDT σκόνη (χρησιμοποιουμένη κυρίως διά τήν καταπολέμησιν τῶν ψειρῶν). Δέν πρέπει ν' ἀραιοῦται οὔτε νά χρησιμοποιῆται πρός παρασκευήν ὑγρῶν διαλυμάτων πρός ψεκασμόν.

γ. 5% DDT διάλυσις (χρησιμωτάτη διά τήν καταστροφήν ἄλλων ἐντόμων).

2. ΤΙ ΕΝΤΟΜΑ ΘΕΛΕΤΕ ΝΑ ΦΟΝΕΥΣΕΤΕ;

α. Ψείρες; Χρησιμοποιήσατε σκόνην 10%. Ἐπικάσατε τήν κεφαλήν, τήν ράχην, τάς μασχάλας, μεταξύ τῶν διαφόρων ἐνδυμάτων καί ἐπί τῶν κρεββατιῶν.

β. Ψύλλους; Ἐπί τοῦ σώματος χρησιμοποιήσατε ἐπικάσεις, ὅπως διά τί ψεῖρες. Οἱ ψύλλοι ἀναπτύσσονται ἐπί τοῦ ἐδάφους εἰς θέσεις ὅπου ὑπάρχει σκόνη, ὅπως τά χοιροστάσια, κοτέτσια, γκαράζ καί ὑπό τάς κατοικίας. Ψεκάσατε τάς θέσεις ὅπου ὑπάρχουν ψύλλοι, μέ διάλυσιν 5% ἤ ἐπικάσατε μέ σκόνην 10%. Ἐνεργήσατε ὁμοίως ἐλαφρῶς ἐπί τῶν ταπήτων καί τῶν δαπέδων τῆς οἰκίας.

γ. Κατσαρίδες; Δυσκόλως φονεύονται. Ψεκάσατε 5% διάλυσιν (μέχρις ὑγράνσεως) εἰς τάς θέσεις ἀκριβῶς, ὅπου ἐνεφανίσθησαν, ὅπως ὄπισθεν ψυγείων, εἰς γωνίας καί νεροχύτας, κατά μῆκος τῶν πατωμάτων πλησίον τῶν τοίχων κλπ. Ἀκολούθως ἐπικάσατε τά περάσματα των μέ σκόνην 10%.

δ. Κοριούς; Εὐκόλως φονεύονται. Ψεκάσατε τρύπας, ρωγμάς τῶν τοίχων καί συνδέσμους τῶν κρεββατιῶν μέ διάλυσιν 5%. Μία ἐφαρμογή εἶναι ἀποτελεσματική ἐπί 12 ἕως 13 μῆνας.

ε. Μυῖγες; Ψεκάσατε διάλυσιν 5% ἐπί τῶν ἐπιφανειῶν, μετά τῶν ὁποίων θέλουν ἔλθει εἰς ἐπαφήν. Οἱ μυῖγες συνηθίζουν νά ἀναπαύωνται ἤ νά ἐπικάθηνται ἐπί ἐλαφρῶν σχοινίων ἤ ἀντικειμένων ἐξηρτημένων ἐκ τῆς ὀροφῆς. Ψεκάσατε ἤ ρυθίσατε σχοινία, σπάγγους ἤ λωρίδας ὑφάσματος εἰς διάλυσιν 5% καί

DIRECTIONS FOR EFFECTIVE AND ECONOMICAL USES OF DDT

WHEN APPLIED BY PRIVATE INDIVIDUALS

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1. DDT COMES IN DIFFERENT FORMS.

   a. 100% pure DDT (a white, sticky, crystalline substance, not issued for household use.) Used in making liquid spray solutions.

   b. 10% DDT Powder (used primarily for louse control). Not to be diluted nor used for making liquid spray solutions.

   c. 5% DDT solution (most useful form for killing other insects).

2. WHAT INSECTS DO YOU WANT TO KILL?

   a. Lice? — Use 10% Powder. Sprinkle on head, down back, under arms, between layers of clothing, and on beds.

   b. Fleas? — If on body, use dusting methods same as for lice. Fleas breed on the ground in d u s t y p l a c e s, such as pig pens, chicken houses, garages, and under dwellings. Spray infested places with 5% solution or sprinkle with 10% dust. Treat lightly rugs and floors of the house.

   c. Cockroaches? — Difficult to kill. Spray 5% solution (until wet) on exact spots where they have been seen, such as behind ice-boxes, edge of sinks, along floor near the wall etc. Then sprinkle thei run-ways with a 10% powder.

   d. Bedbugs? — Easy to kill. Spray mattresses, cracks in the walls, and joints of beds with a 5% solution. One application effective from 12 to 18 months.

   e. Flies? — Spray 5% solution on surfaces that they will touch. Flies like to rest or roast on electric light cords or objects hanging down from the ceiling. Spray or dip cords, strings, or strips of cloth in 5% solution and hang from the ceiling. Eventually all flies in the room will go there to rest and will be killed.

   f. Mosquitoes? — Use 5% solution and spray (until wet) all dark, cool corners of rooms (and behind beds and pictures) where mosquitoes rest during the day.

ἐναρτήσατέ τι ἀπό τῆς ὀροφῆς. Τελικῶς ὅλες οἱ μυῖγες εἰς τό δωμάτιον θά φονεύωνται.

στ. Κουνούπια: Χρησιμοποιήσατε διάλυσιν 5% καί ψεκάσατε (μέχρις ὑγρά-νσεως) ὅλας τάς σκοτεινάς ἐπιφανείας χωνίας τῶν δωματίων (καί ὀπισθεν τῶν κρεβατιῶν καί εἰκόνων), ὅπου τά κουνούπια ἀναπαύονται κατά τήν διάρκειαν τῆς ἡμέρας.

ζ. Σκῶροι: Ἐπιπάσατε ἐλαφρῶς τά ἐνδύματα ἤ αἱ χαλιά μέ σκόνην 10% DDT ἤ ψεκάσατε μέ διάλυσιν 5% DDT εἰς καθαρόν φωτιστικόν πετρέλαιον ἤ εἰς γαλάκτωμα ὕδατος μέ ξυλένιον.

η. Ἔντομα ἐπιβλαβῆ εἰς τήν γεωργίαν: Εἰς τό μέλλον μεγάλαι χρήσεις τοῦ DDT θέλουν γίνη πρός καταπολέμησιν τῶν ἐπιβλαβῶν ἐντόμων εἰς τήν γεωργίαν. Αἱ μέθοδοι χρησιμοποιήσεως θά ποικίλουν ἀναλόγως τῆς βιολογίας τῶν εἰδῶν τῶν ἐντόμων.

g. Clothes Moths? Treat clothes or rugs lightly with a 10% DDT powder or spray with a DDT solution in refined kerosene or xylene water emulsion.

h. Arricultural Pests? The greatest future uses of DDT will be to control agricultural pests. Methods of application will vary according to the biology of the insect species.

C O N T E N T S

LIST OF MAPS AND DIAGRAMS

1) The swamps of Greece.

2) Airspray program.

3) DDT experiment in Petroto, Macedonia. By Dr.A. Mandecos.

4) Number of patients with positive malaria blood in Salonika. By Dr. A. Mandecos.

5) Parasite Indices in Villages of Macedonia 1932-1945. by Dr. A. Mandecos.

6) Spleen Indices in villages of Macedonia 1932-1945. by Dr. A. Mandecos.

7) Spleen and Parasite Indices - Island of Crete-1946. By U.S. Navy Epidemiology Unit No. 404.

8) Spleen and Parasite Indices - Epirus 1946. By U.S. Navy Epidemiology Unit No. 404.

9) Spleen and Parasite Indices - Island of Corfu 1946. By U.S. Navy Epidemiology Unit No. 404.

10) Spleen and Parasite Indices - Island of Mytilene 1945. By U.S. Navy Ep.Unit.

11) Spleen and Parasite Indices - W.Peloponnese. By U.S. Navy Ep.Unit.

12) Spleen and Parasite Indices - Macedonia. By Wellcome Trust Research Laboratories.

13) Spleen and Parasite Indices - Thrace 1946. By U.S. Navy Epidemiology Unit No. 404.

14) DDT Residual Spraying Jan. 1 to Sept. 30, 1946.

15) Organisation Chart, with costs.

16) Supplement to the Organization Chart.

REPORT ON THE ACTIVITIES OF THE
SANITATION SECTION OF HEALTH DIVISION UNRRA
FROM NOV. 1944 TO DEC. 1946.

By : D.E.Wright, Col. U.S.P.H.S.

The month of Nov. 1944 was spent by the representative of the Sanitary Engineering Section making a first hand study of actual conditions in Greece, from the standpoint of general sanitation and malaria.

An investigation to determine what remained of the old organization of malaria control and sanitation, how it had functioned during the occupation period, and what plans, if any, were being made to handle the malaria problem, was carried out and our findings were as follows:

1. The malaria organization was more or less intact, and consisted of approximately three hundred Doctors, and Inspectors, the greater number of which had been given a course in the School of Hygiene on general sanitation and malaria control. These men, with few exceptions, were all congregated in Athens and Salonika with their families.

2. There was no material available with which control measures could be started. Such equipment as was on hand, with few exceptions, was worn out or at least badly in need of repairs.

3. It was found that while the program, started by the Rockfeller Foundation, had been largely expanded, it was still far from being developed to a point where it was possible to give protection to the country as a whole. It was estimated that partial protection was being given to approximately six hundred thousand rural and four hundred thousand urban inhabitants, and the cost of this protection was all that the Government felt able to appropriate.

Our knowledge of the country convinced us that a master program of malaria control could be inaugurated by making use of modern equipment and material, and that this program would be possible with less personnel than had been employed in the past. When properly organized, it would give protection to three and a half million rural population and six hundred thousand urban.

The entire question was thoroughly discussed with the Director General of Health and the Chief Malariologist of the Government, and on their request we proceeded to

draw up a general plan of operation by obtaining maps of the entire country and planning in such a way that the bulk of the larva control could be handled by airplanes.

We also worked out a list of material and equipment that we estimated would be required to perform the work in a satisfactory manner, also the minimum personnel it was estimated would be required.

A number of lectures were given at the School of Hygiene to doctors, engineers and inspectors on the use of DDT, not only as a means of controlling larvae and adult mosquitoes, but for the control of lice to prevent typhus; the value of DDT as a fly control agent as well as a destroyer of other insect life. General sanitation, which had never been given the attention it deserved, had materially deteriorated since the war started, and typhoid and other intestinal troubles were prevalent in all sections of the country.

Due to the revolution in December and January, and the unsettled condition of the country generally, it was impossible to get crews in the field for general work before May, which was late for mosquito work, and our imported personnel was employed on work of an emergency nature in and around hospitals during the early part of the year.

In drawing up our organization chart it was planned to have a Greek opposite for each U.S.P.H.S. officer imported by UNRRA, and a request was made for 15 graduate sanitary engineers (American) with a minimum of two years' practical experience. It was not possible to fulfil this request at the time. We had a total of 19 engineers and sanitarians assigned to the Greek Mission, but at no time did we have more than ten, and when the war ended there was a general exit of all of those that could possibly get out of the service, which made it very difficult to round out a real organization and provide the necessary practical training to the Greek engineers, on which we had hoped to build a permanent organization for the country. This training was still further jeopardized by having about half of the Greek engineers called up for military service.

For the malaria campaign of 1946 not one of the American personnel that worked in the field through 1945 stayed through the season, and less than half of the Greek engineers. This made effective work all the more difficult to perform, as it was a question of constantly training new men and of having them

learn the territory in which they were assigned. With but few exceptions there can be nothing but the highest praise for the men assigned from the U.S.P.H.S. , as they were enthusiastic and anxious to do good work under the most trying and abnormal conditions. They were assigned a task with as near nothing to work with as is possible to imagine,and where there was everything to be done. It is conditions of this kind that are calculated to break the heart of the strongest and most experienced.

History may some day record the true story of how the UNRRA Greek Mission as a whole attempted to accomplish the impossible under the agreement which it was supposed to work, lack of trained personnel, the wherewithal with which to work, and the completely abnormal conditions in the country. It is believed that if the most severe critic will make a fair analysis, he will concede that the work on the whole is deserving of praise rather than criticism.

In attempting to describe work done and methods employed it is necessary to briefly at least draw a picture of the magnitude of the problem to be handled in the country as a whole.

Due to its hydro-geological and climatic conditions and other various causes, Greece has been suffering from malaria more than any other country in Europe, Balkans inclusive. The average number of malaria cases ranges between 1-2 millions annually (this was said to have reached a figure of 3 million in 1942 out of a population of a little over seven million), and the number of deaths amounts to appxm. 5000. Careful surveys carried out show that of the 11000 villages in the country approximately 6000 have a serious malaria problem. To handle this important public health menace in Greece various attempts were made of old, the most important being those made by Dr. Kardamatis and Dr. Savvas. But the first systematic research work and experimental applications began in 1930 with the establishment of the School of Hygiene. The Malaria Division of this School, assisted by the scientific mission of the Rockefeller Foundation, Balfour, Barber, Shannon, Rice and Wright), was able to establish the degree of endemicity in Greece by the systematic taking of malaria indices (spleen and parasitic indices), determined the anopheline species in Greece and the importance of each species as malaria carriers, studied the bilogical qualities of these species and started experimenting on various malaria control methods (larva

control by paris green, house screening, minor drainage projects, gambusia etc.).

GENERAL INFORMATION ON GREECE

The following information is of interest when making a study of the country as a whole for future plans. There is no question but what it would be possible to increase the productive area of Greece by at least 5% if certain, comparatively simple and, when compared to the returns, cheap drainage projects were carried out. With a permanent and effective Sanitary Engineering force in the field, working in conjunction with the Department of Agriculture and the Department of Public Works, a systematic plan of development and reclamation can be worked out over a number of years. This would accomplish two main purposes: reclaim badly needed land and eliminate mosquito breeding areas.

Population, State Budget, National Income, Annual Income per family and available land and work-man-days in Greece.

A. Population. This was estimated on 31-12-1935 at 7.108.814, showing an increase of 14.57% when compared with that found during the 1928 census. The surface area of Greece in the same year was 129.879 square kms., i.e. 54.73 people per s.klm.

During the 1928 census it was found that 67% of the people were living in villages and towns with a population less than 5000 inhabitants and were considered as the rural population, 33% of the people living in larger towns and cities and called the urban population of the country.

During that same census it was found that 42.0% of the population made up the working and producing classes and the remaining 58.0% the parasitic part of the population, consisting of women, children and old and young men without profession.

In Bulgaria, the producing part of the population was during 1926 55.7%, in Turkey 39.2% and in Italy 41.9%.

B. State Budget

	1935-36	1936-37	1937-38	1938-39
Income	12.522.923.000	14.988.961.000	16.577.905.000	15.870.839.000

Percentage of expenditures made by the Ministry of:

	1935-36	1936-37	1937-38	1938-39
Finance	38.6	33.30	32.62	36.23
War	13.5	24.07	18.23	15.88
Education	7.75	6.49	5.89	6.55
Public Health & Welfare	5.71	6.66	7.03	7.24
Agriculture	3.38	2.03	3.45	3.62

C. National Income. This was during 1936 54.952.000.000 Drs. and derived from the following sources:

1. Agriculture and stock-farming :		
a. Agriculture	15.235.000.000	
b. Stock-farming	4.000.000.000	
c. Forests	1.200.000.000	
d. Wine etc.	640.000.000	21.694.000.000
2. Natural Wealth		
a. Mines	465.000.000	
b. Fishing-Hunting	480.000.000	946.000.000
3. Manufactures		
a. Industry	6.190.000.000	
b. Handicraft	3.350.000.000	9.540.000.000
4. Transport		
a. Navigation	1.467.000.000	
b. Commerce	2.630.000.000	
c. Land transport	6.263.000.000	
d. Post-Telg-Tlph.	333.000.000	10.693.000.000
5. Various Sources		
a. Remittances from abroad	1.038.000.000	
b. Insurance	2.645.000.000	
c. Rents	4.200.000.000	8.783.000.000
6. Various Services		
a. Personal Services	870.000.000	
b. Professions	2.425.000.000	3.296.000.000
	Total	54.952.000.000

D. Average Annual Income per Family :

It was estimated by various authors that a rural family consisting of 5-16 members had during 1936 an average net income of 21.685 Drs., i.e. 4.200 Drs. per capita, which is very low, compared with the income of the urban population of Greece , which was 14.525 Drs. per capita, or with that of some other countries: France 70.000 Drs. per family, England 110.000, Germany 96.000 and U.S.A. 235.000 Drs. per family for 90% of the population of these countries.

The following tables obtained from official data are of interest in connection with Malaria in Greece and indicate the importance of its control.

1. A very conservative estimate of the economic losses due to Malaria.

(1921-1938) :

I. Wages lost through sickness:

(Group ages 0-4, 15 = : 64% // 5 - 14 : 36%

Annual death average 4909 x 200 (malaria cases to each death): 981.800 malaria cases
981.800 x 0,64 x 10 (lost wages for at least three malaria attacks) x 35 (wage per day).. 219.923.200

II. Reduced efficiency of the workmen, weakened by anaemia and cachexy: 981.800 x 0,64%x20x35 439.846.400

III. Medical Care:

981.800 x 5 (doctors' calls) x 50 drs.(doctor's fees).. 245.450.000

IV. Malaria Drugs :

981.800 x 50 Drs. (100 (20 gr.) quinine tablets) 49.090.000

V. Losses through death from malaria:

4909 x 250.000 Drs. 1.227.250.000

Total in drachmas, based on pre-war value of drachma 2.181.559.600
Equivalent in $ 21.815.596

Supplementary notes:

1. It is very difficult to estimate in money the losses of the School days' absence, as also the anxiety and the worry caused to the family when a member is sick.

2. We estimate that one death from malaria corresponds to 2000 sick days.

3. It has been found that of the malaria deaths (1925-1938) 84% correspond to the rural population.

4. Estimating the Greek population (1938) at 7.109.000, the cases of malaria on 100.000 population in all Greece were raised to 13.811.

5. A part of the above given data was published by Dr. J. Sphangos in a Greek journal ("Technika", Vol.XV, May, 1944).

6. Dr. Valaoras estimated statistically the number of deaths caused either directly or indirectly by malaria (1933-1937) annually at 28.895.

2. Information obtained by house-to-house survey of two typical villages, one in Peloponnese and one in Thessaly, covering income of inhabitants in summer and autumn of 1941.

		Village of Elefterion, Thessaly (popul. 367, No. of families 70)	Village of Trizin, Peloponnese (popul. 780 no. of famil. 230
Average yearly income per	family	Drs. 41.343.00	30.985.00
" " " "	inhabitant	7.885.50	5.754.00
Maximum income per family		Drs. 120.000.00	300.000.00
Minimum " " "		" 5.000.00	2.000.00
Malaria indices : spleen index	(1939)	61%	(1941) 58%
	parasit. " "	22%	" 63%

Note: Based on pre-war rate : 100 drachmas to £ 1.

3. Extract from the "MALARIA-PUBLIC HEALTH" by Dr.V.G. Valaoras, communicated to the Athens Academy in May, 1944.

Malaria mortality is related to the mortality from other causes, with some of which a high coefficient of correlation is found:

		Coef. of Correla.
Malaria and Pneumonia		% 0,78
"	" Puerperal diseases	% 0,77
"	" Gener.mortality	% 0,77
"	" Tuberculosis	% 0,74
"	" ill-defined causes	% 0,69

Out of this correlation it is deducted that

when malaria mortality is:	the mortality from the following causes on 100,000 population will be:		
	Pneumonia	Puerperal diseases	General Mortality
200	415	31	19,2 per 1000 popul.
100	294	20	16,1 " " "
0	172	8	13,0 " " "

which means that if malaria mortality comes to nil, an approximate number of 25000 persons will be saved from death.

It was a most ambitious plan to attempt to give protection from malaria to the entire population of a country the size of Greece in which 87% of its habitable area is malarious, with almost complete lack of good roads and with but meagre transport for such roads as exist, but we had two things of vital importance in our favor: The full cooperation of the Director General of Health, the Chief Malariologist and his well trained (in the old methods of control) Malariologists and Inspectors, and a thorough knowledge of the country. This cooperation, fortunately for the success of the program, with few exceptions, was given until the end of the 1946 season when the Minister of Health, for political reasons, almost completely disrupted the organization, and this disruption was still further aided and abetted by professional jealousy, but the program had been carried too far to have any serious effect on the work as a whole. We had fortunately tackled

the most malarious area first, and it was only in the more remote parts of the country that our general insect control program was not carried out, but these areas were very materially aided by our second and most effective control measure, our airplanes, the use of which made the malaria control program in Greece possible. When one considers that one of these planes is capable with ease of doing in one day the work of six thousand men, using the old method of hand syraying, and at the same time making it possible to reach areas impossible to reach in any other way, gives some indication of their value. Due to circumstances over which we had no control, it was not possible to get but a few of our planes operating during the early part of the season, and it was only during the last month and a half that a thorough coverage of the entire area to be sprayed was made. A general resume of the work done by the planes and cost involved is given in the appendage.

Of the approximately five thousand testimonials given by telegrams, letters and personal visitors, in not one instance did we fail to receive the highest praise for the results accomplished, and these were received from people in all walks of life, Governor Generals of Provinces, Mayors of towns and villages, doctors, farm organizations, priests, and individuals stating that not during their life time had they ever before passed the summer months free of mosquitoes, flies, fleas, bed bugs, sand flies and cockroaches. We are not yet able to give the scientific proof of the success of our program from blood and spleen examinations, but teams at present are making these tests and the results will be shown in due time. We do have clinical records from all parts of the country, which show little or no malaria, and it is debatable whether the cases reported are new or relapses. It is very interesting to note here that of the hundreds of non-immunes which UNRRA imported for work in all parts of the country there has not been one new case of malaria reported. This would have been impossible without the measures taken.

A rather interesting report was made by the commanding officer of a large portion of the Greek Army, located in what is normally one of the most malarious areas in the country, that he had not had one case of malaria in his command, and that he had hundreds of pounds of quinine and atebrine in his stores that under the old conditions would have been used.

This picture gives some idea of what the control of malaria would mean to a country like Greece, and what a part control measures would play in bringing about the success or failure of any other work attempted by UNRRA. By some of the uninitiated this importance was not appreciated, and every attempt to prove the point was looked upon with more or less suspicion by those heading up other Divisions and Departments of the organisation. Each felt that his or her work was of equal importance, and that a showing must be made regardless of what the final results might be. This phase of UNRRA's program was given little thought by the idealists that conceived this enormous undertaking in the midst of a world war, where everything was in demand to successfully win a desperate struggle. Such food, clothing, material and equipment as could be provided was done so at more or less sacrifice by those attempting to bring the war to a successful end. It was a simple problem to prepare a program outlining what was necessary to do a good job, but quite another to obtain these supplies in the first place, and to transport in the second. In the case of Greece, the above was not only to be faced, but conditions were still further complicated by the army sent to Greece to assist the Government in exile to re-establish itself, and this necessarily required the requisitioning of much valuable storage space, in an area badly depleted of such space by bombing, fire etc. This made it all the more difficult to receive and properly handle such supplies as were received by UNRRA. Things were still further complicated by M.L., which was a military organisation supposed to do the spade work for UNRRA, independent of the army, but at the same time dependent on it for support. Such organisation as UNRRA had at the time was, theoretically at least, under the direction of this organisation from Nov. 1944 to April 1945. The result of this complicated set up is hard to describe, but there is one thing that all must concede, and that is that it resulted in a final set up that was neither military nor civilian, but with the bad points of both and but few of the good. The above is not stated with any desire to even touch on the history of UNRRA, as others will no doubt some day, if not now, give that, but rather to point out some of the difficulties in the way of one attempting to recruit and put to work a smooth-working and efficient organization.

In Athens we were fortunate in having both as representatives of the American and British M.L. service intelligent medical officers. These men, with their assistants, attempted in so far as was possible to reach all parts of the country, not only to get first hand information, but to render aid where it was most desperately needed.

In Athens, we were able to make our contacts and prepare our plans without interference, and were given assistance where possible, which enabled us to iron out many of what at the time seemed insurmountable problems. For example, we had hundreds of men that were willing to work, that had barely enough clothes to cover their nakedness. One pair of shoes, not always good, and with and without underwear. The salaries paid them by the Government was so low that it barely provided food for themselves and family while living together. To send them out in the country, and leave their family in the cities, without extra compensation, was not possible. We first managed to obtain working clothes, and then the question of living expense was tackled, which was by no means easy, as we were opening a question that affected every Department of the Government, but fortunately the matter was settled in our favor, and we were able to face our malaria problem with a nucleus of men whose morale had been restored, in part at least. But our troubles were by no means over, as we were faced with the question of starting work with little or no transportation; such as was in the country was taken over by administrative services, and it was only by begging, borrowing and stealing that we were able to get anything for operational purposes. Too much credit cannot be given the Regional Engineers, Malariologists, and Inspectors of the Government Malaria service for the work they accomplished in 1945. Their instructions were to fight mosquitoes with everything they could get their hands on, and this they did with oil, paris green, flit, and fortunately we were able to obtain twenty tons of pure DDT which was as widely dispersed as possible over the country, with instructions to use it only as a residual spray in houses, barns, and other outbuildings for propaganda to support the drive we had every intention to make in 1946 when

we could hope to receive the material we had ordered. The results were all that we could have hoped for. The widespread use of oil, paris green and flit kept malaria at the lowest recorded figure in the history of the country. It was those that were fortunate enough to have their premises thoroughly sprayed with a 5% solution of DDT that gave us our real publicity, for they suddenly realised that they were not only free of mosquitoes, but what to them was of equal importance flies, bed bugs, lice, fleas, sand flies and cockroaches. So far as available material permitted, we continued the residual spray work throughout the winter of 1945 and 1946, and when full work got under way in the spring of 46, we had the village people of the entire country enthusiastically with us and begging to have their houses sprayed. It was the work of 1945 that brought most of UNRRA's Regional Directors into line, and gave us much more cooperation than we had been given in 1945, for even the most confirmed doubting Thomases could not help noticing the fantastic results that were obtained where a thorough piece of work had been done.

We had hoped against hope that we were going to be able to get a few of the planes we had programmed for in operation during 1945, but this proved impossible and as a matter of fact it was not until late spring that we were able to keep a sufficient number in the air to reach all areas of the country. A detail of plane operation and costs are in the appendix.

No one denies the fact that it was the work done by the planes that rounded out the over-all results, taking the country as a whole. Lack of material, trained organization, transportation and equipment made it a physical impossibility to reach all areas during the year, but our effort was still further handicapped by a determination on the part of the Minister of Health, aided and abetted by professional jealousy from certain high quarters to completely disrupt the organization. The operation of the airplanes fortunately was free of political interference. As the pilots and mechanics were a part of the regular air force under the Minister of Air of the Government, they could not be touched by the Minister of Health nor by the Chief of the old Malaria service or his assistants, but this did not prevent them from causing plenty trouble by publishing articles from time to time to frighten the people or rather certain vested interests into bringing pressure to bear to have airplane spraying stopped.

We were going to kill all the bees. This had to be proved false by having a careful investigation made by the Dept. of Agriculture. We were going to kill all the fish. The Department of Fisheries had to prove that charge false. We were going to wipe out the silkworm industry. This again had to be investigated and found groundless. A very influential and large plantation owner came to my office one day, almost out of breath, to entreat me not to spray a two hundred acre swamp near the center of his plantation and a notorious breeding place for mosquitoes, as he had been told by a Malariologist that the spraying of the swamp would cause the land on the rest of his plantation to become sterile. At the time I had the magazine "Fortune" on my desk with an excellent article on the value of DDT to Agriculture, which I gave him to read, along with a number of other articles from the U.S. Dept. of Agriculture, which thoroughly satisfied him. He has since made a statement to the effect that this has been the most profitable year he or his father before him ever had from the place. The swamp on his place had been r esponsible for almost 100% malaria in three surrounding villages which this year were free of the disease.

Airplane work alone, if done systematically and under proper supervision in the lowlands and coastal area, could eliminate mosquitoes in many areas, and in others keep the density so low that malaria would cease to be a problem. We have letters by the hundreds from farmers that live in villages high in the hills, but farm land near swamps and during harvest time sleep in their fields to protect their crops. In the past they tried to protect themselves by nets, repellents etc. but in the end had a severe attack of malaria. This year they were able to get a good night's rest without precautions and have kept free of malaria. This was only possible by means of spraying by plane, as the large majority of the swamps are of such nature that it is next if not impossible to treat them by hand methods from boats or by wading, and the cost is almost nothing in comparison by plane when one considers as stated before that the plane can with ease do the work of six thousand men effectively with a fourth or less material. Greece is fortunate

in that it has for next year's work 15 planes, fully equipped and in excellent condition for starting spray work when the season begins, and two planes for inspection and trouble shooters. We started work this year with five planes, and it was only near the middle of the season that we were able to get as many as eight in the air. It was no small task to train the pilots to handle the planes, and even more of a task to train them to do effective spray work. It was necessary to have them learn the areas to which they were assigned and work out in cooperation with the Engineers the best and most economical way to handle the job in question, all of which took time and patience. In the early days we had many accidents, fortunately only one of a serious nature. This ceased to cause us trouble during the latter part of the season, and before the time came to suspend operations, we had each of our planes in such condition that in case a plane in any area for any cause whatever ceased operations, we were able to replace it with another. The fact that we were slow in getting our planes equipped and in operation was no reflection on our Chief Mechanic, who did an excellent job, but to the fact that spare parts, tools and other indispensable equipment was slow in arriving. With everything one can ask for available at present- planes in excellent condition, pilots trained and familiar with the areas to be treated, a thorough job could be done another year, if sabotage is not resorted to by those that fear serious financial loss from lack of fees received from treating malaria, diarrhea, dysentery, and many other diseases that will be cleaned up or very materially reduced.

We have demonstrated this year that by careful and systematic spraying of the garbage dumps and other fly breeding areas by plane the flies in the larger cities can be just about eliminated, and when this work is still further aided by all residents spraying their houses thoroughly, the fly nuisance will cease to exist along with other pests that have flourished in the past.

We were not able to do but very little demonstration work for the Agricultural Department this year through lack of planes, material and a

definite commitment on the part of the Agricultural Dept. as to just what they wanted us to do. Where work was done under proper conditions, the results were excellent on the destruction of the Dakus fly on olive trees and the tent caterpillar and one kind of aphis on apples. It is my prediction that in from one to two years from now DDT will be the material used to protect the olive crop the cost of which is so high at present by the old methods used. It would be possible to do the malaria work and a thorough job of protecting the olives for half what is spent on the olives alone in an average year.

We experimented with the use of 26% emulsion in lime for white-washing houses, with excellent results. Houses sprayed with our regular 5% spray side by side with houses white-washed with lime containing the emulsion showed equal results in so far as toxicity was concerned. We have been keeping close check on this work since last April, using control houses that were neither sprayed nor white-washed.

This method of applying residual spray to village dwellings will save large sums of money in Greece, as it is almost an order of the church that every house must be thoroughly white-washed before Easter each year, and every housewife makes it a point of doing a thorough job. By determining the number of houses and approximate surface to be white-washed, emulsion can be furnished the villages in bulk, and distributed by a reliable individual as required.

CONCLUSIONS

1. In spite of all obstacles, UNRRA did a creditable and valuable piece of work in Greece from a general sanitation standpoint.

2. A plan of mosquito control on a scale never before attempted was put into effect, with results far beyond the expectations of the most optimistic.

3. A clear-cut demonstration was made of the fact that, with the use of DDT in a proper manner and under good supervision, it is possible not only to control malaria but to eradicate mosquitoes and insects of all kinds that affect or are a nuisance to mankind.

4. Residual spray in houses, when applied in the proper manner and right strength, will not only destroy mosquitoes but all other insects that infest houses and other outbuildings, such as flies, bed bugs, fleas and sand flies.

5. By the Thermal aerosol method of applying DDT by airplane it is possible to completely control mosquito breeding in swamps at a remarkably low cost for material and labor, and without dangerous effect on fish or aquatic life.

6. Since it is possible under normal conditions to do the work with one plane of six thousand or more men effectively, with a third of the material used by hand spraying, this method of mosquito control should be universally used, as the rather high initial cost for the plane is soon compensated for when work is done on a large scale.

7. It was clearly demonstrated that one man could with ease care for as much as 17 miles of mountain streams with a pressure hand sprayer of half gallon capacity. A quart bottle of 25% emulsion in his pocket or a small shoulder bag, in addition to his loaded sprayer, will provide him with material for a full day's work. This very largely solves the transportation problem.

8. In spraying houses or other buildings the slot or what is called the broom spray nozzle should be used. This gives a uniform coat of 200 mg. per sq. ft., does not waste material, and speeds up the work.

9. The results of many experiments showed that a 5% DDT solution was the most effective and economical mixture to use. Less did not last, and there was no noticeable advantage in using more.

10. The surface sprayed in houses and outbuildings may show quite a difference in so far as results are concerned, due to their general texture and condition. Care should be taken to see that heavy coats of dust and cobwebs are removed. Glazed surfaces or others that do not permit penetration may result in the DDT sloughing when the solvent evaporates. We have perfect examples where the spraying has been effective for three hundred plus days, while in others re-spraying was necessary in sixty days or less.

11. The lasting effect of the thermal aerosol spraying by plane largely depends on the general nature of the growth in the swamp. We sprayed areas that were heavily infested, with perfect results for as long as 45 days; others required re-spraying after 15 days.

12. To get perfect control in thick rice paddies we sprayed every 15 days.

13. For experimental purposes we sprayed a number of villages, street by street, with such good results from the standpoint of fly, flea and sand-fly control, that we believe it should be done in all villages at intervals, where bees are not kept that feed on the blooming flowers.

14. Where judgment is used, there should be no serious loss to bee raisers. Repeated tests proved that during the past season.

15. It was thoroughly demonstrated that the village people will gladly provide the required labor for doing residual spray work in their villages, if material and spray material is provided. This plan should be strictly followed in next year's work.

16. Where from one half to a pint of 20% DDT in Velsicol per acre is used for spraying around the edges of lake areas, no fish were killed.

17. Where DDT is used intelligently, there is no danger to man or beast, and it is by far the most economical and effective insect control drug that has been put on the market to date, and one can truthfully say it is the answer to a sanitarian's prayer.

Too much credit cannot be given to all of those who took an active part in the insect control program that was carried out in Greece during 1946, for the results obtained were only possible by the untiring effort on the part of all concerned.

We were given whole-hearted support by the many Ministers of Health, with one unfortunate exception, but this Minister not only attempted to destroy the malaria control program, but every other phase of public health. We were given full and complete cooperation by the General Director of Health and by the Chief Malariologist of the School of Hygiene and his assistants, with few exceptions. DDT was completely new to all the forces, and it was no more than natural that doubters and pessimists would be found, but it is safe to say that there are few left, after witnessing the results in Greece this year. It is our hope that the program can be carried on and even better results obtained next year.

GENERAL SANITATION AND MALARIA CONTROL IN GREECE.

Like everything else in Greece, general sanitation such as there was in the country, was brought to a complete standstill every place but where it was absolutely necessary as a protection to the occupation troops, and as a result, there was general deterioration, water mains were broken and in places removed, pumps were completely wrecked due to lack in many cases of simple spare parts for repairs, septic tanks and cesspools were made worthless due to lack of attention, bodies and pumps were removed from trucks for emptying cesspools and the chassis used for other purposes. The typhoid rate, always high in the country, was greatly increased and is to-day a serious menace, due to lack of pipe, pumps, chlorinators, storage tanks etc. The Sanitation Section programmed to meet the worst conditions existing, but Procurement to date has been unable to furnish the material requested and as a result, only a very small percent of the work that might have been done to reduce the high sick rate has been possible. Surveys have been made, estimates prepared, and the foundation of an organisation laid to carry out a large percent of the urgently needed work, even at this late date, if material and equipment could be made available.

A strenuous effort has been and is being made to rehabilitate and equip hospitals, and plans for new construction is well under way, but our hands have been tied on the preventive side, which could very largely reduce the curative requirements and, what is even more important, increase badly needed production of foodstuff etc.

Our malaria control work is off to a good start, after barely holding our own and getting organised in 1945, when we used everything we could beg, borrow or steal that would destroy mosquitoes and their larvae, paris green, crude oil, flit, malaria oil, and the few tons of DDT that we were able to obtain. [redacted] It was where we used this latter that marvellous results were obtained, both as a residual spray and for larva control. By the combined means of all methods possible, and a small partially organized force, and little or no transport, we held malaria at the lowest point in the history of the country and checked our results by controls where no work was done. And while, as stated, we are off to a good start in 1946, we are close to six week behind schedule, due to procurement failing to provide us with the required material and equipment as promised. At present we have men in every part of the country and driving hard to save the country

of making a study of what expansion in organization, equipment and material would be required to put on a program of malaria control that would reach every part of the country. The expanse of swamp areas, approximately 500 sq. miles, made it absolutely necessary that airplanes be used for treatment. It had been demonstrated that a plane of the type we desired would spray 17 acres a minute or ten thousand two hundred acres an hour, or ten planes to give us coverage with safety, for respraying which experience demonstrated was necessary every ten to twenty six days, depending on the nature of the swaps and the thoroughness of the application.

Our next step was to determine the total number of dwelling houses, stables, pigpens, chicken houses, sheep folds, warehouses, wine cellars etc. in the rural areas, and take typical cross sections to determine the number of sq. feet to be sprayed as a residual spray for adults. The number of houses to be sprayed were 700.000 plus and the number of outbuildings, the stables of which in a number of cases were a part of the house, equalled on the average the number of dwellings, but with a third less area to spray. From these figures we worked out the number of tons of DDT required, using 200 mg. DDT per sq. ft. or 4 c.c. 5% solution. Our experience in 1945 from houses in highly infested areas, sprayed in June and examined every week until October, showed zero catches, while control houses continued to yield high numbers, which convinced us that one thorough spraying, with possibly few exceptions, would carry us through the season. This control measure being further aided by spraying all areas not reached by the planes with oil or a DDT emulsion applied by hand sprayers, should give the country protection, and in many places eradication of mosquitoes.

The program as outlined is going to do far more than control malaria, as the DDT spraying of the houses will assist in controlling, if not eliminating, lice, bed bugs, fleas, cockroaches, sand flies, and flies. This in itself would justify the expense of spraying and in future years will gladly stand all expense involved, when material is available.

We have just received word that the Minister of Health has issued an order to the effect that all malaria control work in the different Nomes is placed under the control of the Nomiatros, who will be responsible for the carrying on of the work, and the Malariologists will act as technical advisers. This order was issued it is stated at the instigation of the Chief Malariologist of the School of Hygiene, who knows full well that the order at this time, right in the midst of the season, will completely paralyse the work and destroy the effect of all that has been done to date this year.

Without my knowledge, it seems that the intention to have such an order issued was known in the Regions some time ago, and as a result all effective work stopped, as the trained men and inspectors realised that it would mean that most if not all of them would be dismissed and replaced by untrained men, and their enthusiasm and interest in the work ceased.

We have concrete evidence of this from several places. In Macedonia for instance, larva is being found in breeding places close to the city of Salonica, although the Inspectors and men are supposed to be patrolling the areas and using proper control measures.

If this order is not rescinded and the trained men assured that they will carry on for the remainder of the malaria season as they have in the past, we believe it advisable to discontinue all work in so far as UNRRA is concerned, and cancel future delivery of material, as it will only be wasted or reach the black market.

The proposal to have the Inspectors assigned the different Nomiatros has many advantages, if a proper foundation is laid and the men prepared for the change, by calling them together and explaining the change, and assuring them that they are safe in their new jobs, and that they will receive their instructions from the Sanitary Engineers who willcooperate with the Nomiatros in carrying out the insect control work as well as look after sanitary projects, such as small water supplies, latrine construction, garbage disposal, rat control etc. An organization worked up on this basis would insure twelve months a year work, and if given the proper support from H.Q. would result in a thoroughly interested and loyal organisation.

It is believed that the time has come when the Greek people as a whole should be given some idea of the importance of the general sanitary program inaugurated in Greece for mosquito and general insect control.

In 1945, due to lack of material and equipment, it was not possible to expand the program over the entire country, but every effort possible was made to extend the control of mosquitoes and other insects as far as available material and equipment permitted, and the results were gratifyingly good. The people that were fortunate enough to be taken care of by the limited amount of DDT we obtained in 1945 were more than enthusiastic over the results, and the news of these results spread far and wide, which ensured us enthusiastic support for the 1946 program.

The thing that not all people realise is that by using DDT as an insect control measure, we completely eliminate the old idea of mosquito control to prevent malaria, and tackle the problem as a sanitary oneby eliminating or controlling all insects that are not only a nuisance but a danger to mankind in his dwelling. In other words, DDT has become the answer to a sanitarian's prayer.

A short time ago in many parts of the world mankind was using the services of Malariologists, Entomologists and Engineers to control the malaria mosquito on a limited scale by use of Paris green, which is purely a specie control measure and has little or no effect on other species of mosquitoes and other insects, oil and flit to a limited extent, and drainage and fill projects for the reclaiming of land where funds were available. This latter should always be the ultimate end of mosquito control work, while the former could only be considered as a palliative.

By the use of DDT, which is purely a sanitary

spleen rates, parasite rates, and inaugurate and put into execution a campaign to break the malaria chain by the use of proper drugs. The thoroughness with which this work will be done, will be a check on the work done by the Engineers and their Sanitary Inspectors.

Greece to-day is more nearly free of mosquitoes than ever before in its history and at the same time many areas have had other insects, such as flies, bed bugs, lice etc. very materially reduced, if not eliminated. Old residents of Athens are emphatic that never before has the City of Athens been as free of flies as at the present time in summer. Reports from all parts of the country where spraying with DDT has been done show the same results.

Due to financial, political and other reasons, it has not been possible to organise the sanitary program for the entire country in as thorough and efficient a manner as could have been desired. We are now faced with a political situation that can very easily disrupt the program for the entire country, if not make work impossible. It is difficult to see why the Minister of Health would want to take the responsibility of destroying a program that has met with such enthusiastic support from the entire country and will add millions of man days to production, to say nothing of the saving of medical supplies and hospital space.

It is safe to predict that if the present organisation is not disrupted and the same type of control measures are carried on next year, malaria will be one of Greece's minor problems in the future.

We have a promise from reliable sources that the program to date has created so much interest from outside sources, that ample financial aid will be made available to carry the program through another year.

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By the use of DDT, which is purely a sanitary measure for the eradication and control of mosquitoes, flies, bed bugs, cockroaches, lice, ants, sand flies, fleas etc, the Malariologist is relieved of the task of acting as a foreman, and will be in position to perform duties expected of him, such as determine

spleen rates, parasite rates, and inaugurate and put into execution a campaign to break the malaria chain by the use of proper drugs. The thoroughness with which this work will be done, will be a check on the work done by the Engineers and their Sanitary Inspectors.

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DIRECTIONS FOR EFFECTIVE AND ECONOMICAL USES OF DDT WHEN APPLIED BY PRIVATE INDIVIDUALS

1. DDT COMES IN DIFFERENT FORMS.
   a. 100% pure DDT (a white, sticky, crystalline substance, not issued for household use).
   b. 10% DDT Powder (used primarily for louse control).
   c. 5% DDT solution (most useful form for killing other insects).

2. DDT IS SLOW ACTING.
   When a surface is sprayed and the liquid evaporates, small DDT particles are left evenly distributed. Death to insects is determined by the rate of absorption of these particles through the insect's body or fect. They m u s t t o u c h the DDT trated surface in order to absorb a lethal dose. After contact some insects, take «the DDT's», stagger about, and die aftep 5 or 10 minutes. Others may survive for 348 hours. However, once they touch DDT, death is usually inevitable.

3. WHAT INSECTS DO YOU WANT TO KILL?
   a. Lice? Use 10% Powder. Sprinkle on head, down back, under arms, between layers of clothiing, and on beds.
   b. Fleas? If on body, use dusting methods same as for lice. Flees breed on the ground in d u s t y p l a c e s, such as pig pens, chicken houses, garages, and under dwellings. Spray infested places with 5% solution or sprinkle with 10% dust. Treat lightly rugs and floors of the house.
   c. Cockroaches? Difficult to kill. Spray 5% solution (until wet) on exact spots where they have been seen, such as behind ice-boxes, edge of sinks, along floor near the wall etc. Then sprinkle their run-ways with a 10% powder.
   d. Bedbugs? Easy to kill. Spray mattresses, cracks in the walls, and joints of beds with a 5% solution. One application effective from 12 to 18 months.
   e. Flies? Spray 5% solution on surfaces that they will touch. Flies like to rest or roast on light cords or objects hanging down from the ceiling. Spray or dip cords, strings or cloth in 5% solution and hang from the ceiling. Eventually all flies in the room will be killed.
   f. Mosquitoes? Use 5% solution and spray (until wet) all dark, cool corners of rooms (and behind beds and pictures) where mosquitoes rest during the day.

ΟΔΗΓΙΑΙ ΔΙΑ ΤΗΝ ΑΠΟΤΕΛΕΣΜΑΤΙΚΗΝ & ΟΙΚΟΝΟΜΙΚΗΝ ΧΡΗΣΙΝ ΤΟΥ DDT ΚΑΤΑ ΤΗΝ ΧΡΗΣΙΜΟΠΟΙΗΣΙΝ ΤΟΥ ΥΠΟ ΙΔΙΩΤΩΝ

1. ΤΟ DDT ΠΑΡΕΧΕΤΑΙ ΥΠΟ ΔΙΑΦΟΡΟΥΣ ΜΟΡΦΑΣ.

α' 100% καθαρὸν DDT (λευκή, κολλώδης, κρυσταλλικὴ οὐσία. Δὲν παρέχεται δι' οἰκιακὴν χρῆσιν).

β' 10% DDT σκόνη (χρησιμοποιουμένη κυρίως διὰ τὴν καταπολέμησιν τῶν ψειρῶν).

γ' 5% DDT διάλυσις (χρησιμοτάτη διὰ τὴν καταστροφὴν ἄλλων ἐντόμων).

2. ΤΟ DDT ΕΝΕΡΓΕΙ ΒΡΑΔΕΩΣ.

"Οταν μία ἐπιφάνεια ψεκασθῇ καὶ τὸ ὑγρὸν ἐξατμισθῇ, μικροὶ κρύσταλλοι DDT παραμένουν ὁμοιομόρφως κατανεμημένοι. Ὁ θάνατος τῶν ἐντόμων ἐξαρτᾶται ἐκ τῆς ἀναλογίας ἀπορροφήσεως αὐτῶν τῶν μορίων ὑπὸ τοῦ σώματος ἢ τῶν ποδῶν τῶν ἐντόμων. Πρέπει νὰ ἔλθουν εἰς ἐπαφήν μὲ τὴν ψεκασθεῖσαν ἐπιφάνειαν μὲ DDT διὰ ν' ἀπορροφήσουν μίαν θανατηφόρον δόσιν. Μετὰ τὴν ἐπαφὴν μερικὰ ἔντομα ζαλίζονται, παραπαίουν καὶ ἀποθνήσκουν μετὰ 5 ἕως 10 λεπτά. Ἀλλὰ δύνανται νὰ ἐπιζήσουν ἐπὶ 48 ὥρας. Ἐν πάσει περιπτώσει, ἐφ' ὅσον ἅπαξ ἔλθουν εἰς ἐπαφὴν μὲ τὸ DDT, ὁ θάνατος εἶναι συνήθως ἀναπόφευκτος.

3. ΤΙ ΕΝΤΟΜΑ ΘΕΛΕΤΕ ΝΑ ΦΟΝΕΥΣΕΤΕ;

α' Ψεῖρες; Χρησιμοποιήσατε σκόνην 10%. Ἐπιπάσετε τὴν κεφαλήν, τὴν ράχιν, τὰς μασχάλας, μεταξὺ τῶν διαφόρων ἐνδυμάτων καὶ ἐπὶ τῶν κρεββατιῶν.

β' Ψύλλους; Ἐπὶ τοῦ σώματος χρησιμοποιήσατε ἐπιπάσεις, ὅπως διὰ τὶς ψεῖρες. Οἱ ψύλλοι ἀναπτύσσονται ἐπὶ τοῦ ἐδάφους εἰς θέσεις ὅπου ὑπάρχει σκόνη, ὅπως τὰ χοιροστάσια, κοτέτσια, γκαράζ καὶ ὑπὸ τὰς κατοικίας. Ψεκάσατε τὰς θέσεις ὅπου ὑπάρχουν ψύλλοι, μὲ διάλυσιν 5% ἢ ἐπιπάσετε μὲ σκόνην 10%. Ἐνεργήσατε ὁμοίως ἐλαφρῶς ἐπὶ τῶν ταπήτων καὶ τῶν δαπέδων τῆς οἰκίας.

γ' Κατσαρίδες; Δυσκόλως φονεύονται. Ψεκάσατε 5% διάλυσιν (μέχρις ὑγράνσεως) εἰς τὰς θέσεις ἀκριβῶς, ὅπου ἐνεφανίσθησαν, ὅπως ὄπισθεν ψυγείων, εἰς γωνίας καὶ νεροχύτας, κατὰ μῆκος τῶν πατωμάτων πλησίον τῶν τοίχων κ.λ.π.. Ἀκολούθως ἐπιπάσατε τὰ περάσματά των μὲ σκόνην 10%.

δ' Κοριούς; Εὐκόλως φονεύονται. Ψεκάσατε στρώματα, ρωγμὰς τῶν τοίχων καὶ συνδέσμους τῶν κρεββατιῶν μὲ διάλυσιν 5%. Μία ἐφαρμογὴ εἶναι ἀποτελεσματικὴ ἐπὶ 12 ἕως 18 μῆνας.

ε' Μυῖγες; Ψεκάσατε διάλυσιν 5% ἐπὶ τῶν ἐπιφανειῶν, μετὰ τῶν ὁποίων θέλουν ἔλθῃ εἰς ἐπαφήν. Ἡ μυῖγες συνηθίζουν νὰ ἀναπαύωνται ἢ νὰ ἐπικάθηνται ἐπὶ ἐλαφρῶν σχοινίων ἢ ἀντικειμένων ἀνηρτημένων ἐκ τῆς ὀροφῆς. Ψεκάσατε ἢ βυθίσατε σχοινία, σπάγγους ἢ λωρίδας ὑφάσματος εἰς διάλυσιν 5% καὶ ἀναρτήσατέ τα ἀπὸ τῆς ὀροφῆς. Τελικῶς ὅλες ἡ μυῖγες εἰς τὸ δωμάτιον θὰ φονεύωνται.

στ' Κουνούπια; Χρησιμοποιήσατε διάλυσιν 5% καὶ ψεκάσατε (μέχρις ὑγράνσεως) ὅλας τὰς σκοτεινὰς δροσερὰς γωνίας τῶν δωματίων (καὶ ὄπισθεν τῶν κρεββατιῶν καὶ εἰκόνων), ὅπου τὰ κουνούπια ἀναπαύωνται κατὰ τὴν διάρκειαν τῆς ἡμέρας.

Col. D. E. Wright

1945

D.D.T. FOR RELIEF AND REHABILITATION

by Gordon E. Smith, Ph. D.*

1. Introduction

As an insecticide, D.D.T. is a new and revolutionary discovery, but it is not an easy "cure all". Exact information about its use is still restricted and, in general, the public has been given overrated and exaggerated reports about its effectiveness. Although it has many limitations, when properly applied it will give fantastic results.

A tremendous amount of research and experimental work has been done with D.D.T. and much more will be done in the months to come. Although the knowledge we have today about its use is considerable, much remains to be learned. Progress and new developments are being made daily. D.D.T. is now definitely out of the experimental stage and is ready to be applied on a national scale for routine control of mosquitoes and other insects of medical importance. The U.S.P.H.S., working on malaria control in war areas will treat approximately 60,000 houses with D.D.T. next year and the Tennessee Valley Authority plans to use it on a wide scale in the various reservoirs as a routine larvicide and adulticide against malaria carrying mosquitoes. It will be distributed mostly by an airplane using a thermal aerosol generator. A 450 H.P. plane so equipped can adequately treat 30 acres per minute by applying 2.1 pounds D.D.T. per acre. The Army and Navy are now using D.D.T. in many parts of the world to control mosquitoes (larvae and adults), flies, bedbugs, lice, fleas, and cockroaches. They apply it by hand dusters and sprayers, and treat vast areas by aircraft prior to invasion, and continue to treat the large problem areas by aircraft after a base is established. At the present time D.D.T. is being manufactured by 10 or more companies at the rate of approximately 3 million pounds per month. Geigy, Merk, Du Pont, and Hercules are the chief manufacturers. When D.D.T. is finally released and distributed for civilian use, it should be a welcome item in every household in the world.

This brief report is not intended to repeat the detail information about the uses of D.D.T. that may be read in several excellent reports, some attached hereto. It is intended, rather, to summarize the information available that will be most useful to workers in the field and to point out and stress certain conditions and problems that may help make D.D.T. more useful in Relief and Rehabilitation wherever and wherever it is used.

*Sanitarian (R) U.S.P.H.S. - UNRRA Balkan Mission

2. Formulations Most Useful

Mosquitoes, lice, flies, fleas, mites, ticks, bedbugs, cockroaches, and ants are the most common insects for which control is desirable. D.D.T. can be used in many ways effectively to eradicate all of these insects when applied as a dust, an oil solution, an emulsion, or as a thermal aerosol. The best preparation to use will vary according to the insects for which control is desired, on field conditions, the magnitude of the problem, and the materials and equipment available.

A. Dust

When D.D.T. is used as a dust, it must be thoroughly ground with a diluent such as pyrophyllite or talc. At the present time it is a rather sticky substance, and, unless it is improved, it can never be mixed in the field like we can mix Paris Green with road dust. Its greatest use as a 10 per cent powder is for control of lice. (See report No. 4, p. 25, for detail instructions on methods of application.)

Airplane dusting by the Tennessee Valley Authority with a 5 per cent D.D.T. in acepstone controlled 90 per cent of mosquito larvae over 200 feet swaths at actual treatment rates as low as 0.05 lb. per acre. Although a D.D.T. dust is 10 to 100 times as toxic to mosquito larvae as Paris Green, in general it is not practical to use as such since a spray or thermal aerosol application has been found to be more desirable. If, however, it becomes necessary to use the available 5 or 10 per cent D.D.T. dust as a larvicide, it should be diluted to 1 or 2 per cent by mixing with any other available dust, and it can be applied with the ordinary Paris Green hand dusters. The residual effect of small amounts of D.D.T. dust on water is not lasting and will have to be applied about once a week in much the same way as Paris Green. (Recent experiments have shown that D.D.T. is inactivated by mud, and that the residual effects of D.D.T. last longer when applied to clean water in vessels where aedes egypti breed.)

The 10 per cent D.D.T. dust is effective in the control of cockroaches and other insects when applied to their favorable hiding places and allowed to remain. The dust, however, does not "stick" and last as long as a solution sprayed on. If a 5 or 10 per cent dust is the only available form of D.D.T., it should be used for all purposes as a dust to the best advantage since it is not practical to change such a mixture into a solution.

As a powder, D.D.T. is not toxic to the skin and not so much so when taken internally, but in oil solutions, it is often toxic to the skin and very toxic when taken internally.

Quartermaster item No. 41-D-3755 is a special duster used for delousing, but those who have used it say that it is not so good and recommend that Root Jumbo (model P-2) duster as being much better.

This duster is manufactured by the Root Mfg. Co., Cleveland, Ohio. Another very efficient delousing hand duster is the No. 132 Debbins sold by Superbilt Duster, North St. Paul, Minnesota, - Elkhart, Indiana. The large, cumbersom duster manufactured in Cairo, Egypt, is very inefficient.

B. Oil Solutions and Emulsions

As a solution D.D.T. can be used many different ways. It is nearly insoluble in water, and a good solvent is a most important item. Over a hundred solvents have been found for D.D.T. of which some of the most promising ones are tabulated in report No. 4, page 4. Of the solvents listed, cyclohexanone is the best and ethyl alcohol the poorest. In the field, crude kerosene and fuel oil will be available in most places and will be the most practical solvent to use. (Gasoline should not be used.)

Polymethylnaphthalenes, not listed, are very good solvents for D.D.T, and are available in various boiling ranges. VELSICOL NR-70 has the highest boiling range, of about 500° F. to 700° F., and, in many aspects, has been found to be better than cyclohexanone as a solvent. It is cheaper, less volatile, and has about the same solubility. The highest boiling range was chosen for the thermal aerosol insecticide work because of the desirability of having the solvent persist as long as possible. VELSICOL NR-70 consists primarily of tri, tetra, and pentamethylnaphthalenes, and may be procured at a very reasonable rate from the Velsicol Corporation, Chicago, Illinois.

D.D.T. is slowly soluble in oils; rapidly soluble in cyclohexanone, benzene, o-dichlorobenzene, xylene, or Velsicol. If some of these rapidly soluble chemicals are available, the D.D.T. could be dissolved first and then added to the petroleum oils which would reduce the time required for preparation of the material in the field. Dissolving and mixing the material in the field is quite a problem. To mix a solution the hard way, the ingredients are placed in an oil drum and rolled in the sun. This should be allowed to stand for 24 hours if D.D.T. is being dissolved in kerosene or fuel oil. Photographs 8 and 9 show mechanical and hand mixers that have proven practical and useful. One mechanical mixer centrally located could mix enough of the D.D.T. stock solution to supply a wide area with a mixing capacity of 500 gallons a day.

The best emulsion formulae now in use by the armed forces to kill all insects is: 20% D.D.T., 65% xylene, and 15% triton X-100. This stock solution can be diluted with 4 parts of salt or fresh water to give a 5% solution. This is a convenient way to ship D.D.T. It can be diluted in the field with any available water to give the desired percentages.

After using a xylene emulsion, even with fresh water, the sprayers should be cleaned or washed with an oil solution as this preparation tends to rust the equipment.

D.D.T. in oil solutions or as an emulsion has a wide range of application for killing larvae and adult mosquitoes as well as the other insects. To date, we have no specific and best way to apply D.D.T. It has been applied effectively with paint brushes, knapsack sprayers, drip cans, sprinklers, dusters, flit guns, hand pressure sprayers, power sprayers, paint spray guns, and as a spray, smoke, and thermal aerosol from aircrafts ranging in size from the army cub to the large bombers. In every instance where D.D.T. was distributed evenly, good results have been noted. To date, we have no suitable equipment that will apply the small amounts per acre that is required. It is the opinion of the Chief of the Army Sanitary Corp. that the hand equipment formerly used for malaria control work is not suitable for efficient application of D.D.T. He, therefore, has requested the army engineers to design and have manufactured newer and better equipment for the distribution of D.D.T. which is likely to replace all other insecticides for mosquito control. Until such time as the "best" equipment becomes available for the distribution of D.D.T., we will have to use the best that we have or can get at this time.

For men working in the field on insect control, the number one item to have is D.D.T. A good solvent, such as xylene or velsicol, is desirable, but if he does not have it, he can usually get kerosene, fuel oil, or waste crankcase oil to use as a solvent. If the D.D.T. is sent out into the field as an emulsion concentrate, it is, of course, much more desirable and is easier to handle. The item of second importance is equipment for dispensing the D.D.T. For all around, general use it is believed that the Hudson Industrial (No. 7306), 4 gallon, open head pressure sprayer (photograph No. 10) manufactured by the H. D. Hudson Co., Chicago, is the best one to use. The U.S. Army has thousands of Hudson open head sprayers (photograph No. 18) in stand-by condition for possible gas decontamination use. These sprayers may be available some day for the control of insects, and they can be used very well for D.D.T. residual sprays if they are supplied with special (24 - 60 W.S.) nozzles (size 1/4 T 8002 from Spraying Systems Co., Chicago; or size 1/4 0 SLF from Spray Eng. Co., Somerville, Mass.) and oil resisting hose, washers and gaskets. These nozzles are small items, but very important for the successful operation of the sprayers. This type of sprayer is especially good for applying residual sprays, and is better than the oil knapsack type for larvicidal work; but like the knapsack, it is heavy, it leaks oil on back of operator, and too much D.D.T. will be applied with it per acre. A large, hand "flit" pressure sprayer has been found to be an excellent device for applying D.D.T. as a larvicide. (Photographs 5 and 18-A. This is a Superbilt Sprayer from Kilhart, Indiana.)

"Flit" guns can be used but are not suitable for applying residual sprays to buildings because of the time it takes to "wet" the wall. (D.D.T. is supposed to be applied to a wall surface at the rate of approximately 200 mg. per sq. foot, but in routine applications and practice, it will amount to about the same thing as "spraying the wall until it is wet".) Photograph 16 shows a small portable power sprayer equipped with a double nozzle that speeds up residual house spraying. The T. V. A. has developed two simple portable pressure sprayers that are proving very useful and efficient. (See photographs, 18, 19, report No. 3, p. 14, and reports No. 6 and No. 7.) The M.C.W.H. people plan to spray 40,000 houses next year and they will probably use the Hudson Industrial Hand Sprayer and a Hardy Power Sprayer (from the Bean Co., Lansing, Mich.) in most of this work.

Certain large swamp areas will be impractical to treat by hand for mosquito control. The most economical and efficient way to treat such areas will be by aircraft. Wide use has been made of the army cub plane for spraying oil solutions of D.D.T. on the surface as a larvicide. Although the cub spray unit does not give results comparable to the other high powered aircraft equipped with venturi for thermal aerosol generators it has a very useful and definite place for routine treatment of limited areas. It can land and take off on small, temporary landing strips, it is economical to operate, and it can treat 400 to 600 acres a day. Complete spray units designed to fit any cub plane are being made up for distribution to the Army by the Orlando Laboratory. UNRRA can get some of these units through the Surgeon General's office.

The T. V. A. has equipped a Steerman aircraft with a device for distributing oil sprays as well as a venturi for distributing thermal aerosols. A 1/4 in. pipe was run along the trailing edge of the plane to which seven spray nozzles were attached. This pipe was covered with airplane canvas and dope, and only the seven nozzles are visible. A small, wind-driven pump supplies the necessary pressure. (See photograph 20 and 21, report No. 3, p. 34.)

C. Thermal Aerosol

The newest and most effective method for controlling larvae and adult mosquitoes over a wide area has been by the injection of a high concentration of D.D.T. into the hot exhaust gases from an aircraft engine. The results of tests made at T.V.A. using a 450 H.P. engine on a Steerman plane were most encouraging, and a number of modifications of the equipment and formulations of the solution were tested. The National Defense Research Committee at the Munitions Development Laboratory developed a method of atomizing oils preliminary to evaporation by injection into a venturi throat attached to the exhaust manifold of a Navy torpedo bomber. A copy of the blueprint giving exact specifications for a venturi suitable for a 450 H.P. aircraft engine is included in report No. 2. With these specifications and a reasonable amount of material, it is possible that such a venturi can be made by a mechanic in a machine shop in the field and fitted to the type of aircraft available for mosquito-control work. If one

standard type of plane is chosen and purchased for this work, all of the venturi could be made in one place and shipped to the places where they are needed and can be used. The Army and Navy planes are being equipped with similar installations, and they will use this method on a wide scale for larvae and adult mosquito control in all future operations. We should keep in close contact with all new developments in this field and profit by their experience, and apply this method of mosquito control on a permanent basis in all places where it is practical to do so. Potentially, D.D.T. is the most effective insecticide that has ever been used. The purchase of D.D.T. and the latest equipment for distribution should receive first consideration and priority over all other supplies for insect control.

5. Summary

D.D.T. has passed all preliminary laboratory tests and is now ready for practical routine application on a national scale for the control of insects. It has a wide range of application as a dust, an oil solution, an emulsion, or as a thermal aerosol.

Intensive research on D.D.T. continues and many new developments and improvements will be made. As these improvements become applicable to field conditions, they should be adopted. Although much remains to be learned about D.D.T., its immediate utilization for insect control should be prompt and widespread, taking priority over all other insecticides.

24 March 1945

TO: Dr. I. V. Sollins

FROM: Gordon E. Smith - Conrad P. Straub
through: Dr. Wood, Dr. Crabtree

SUBJECT: Emergency Supplies Required for Greek Malaria Control Program.

Unfortunately figures are not available on an annual routine application of DDT by aircraft equipped with thermal aerosol generators; therefore the following figures are the best that can be given based on two years average performance of Stearman airplanes in the T. V. A. using Paris Green dust.

One plane has averaged 200 acres per day for 10 weeks (5 day week).

It used 20 tons of Paris Green per season mixed in 95% soapstone.

Each plane flew from 100 to 120 dusting hours per season.

Calculations:

1. It must be remembered that the 200 acres per day is the average and that on a good flying day it might be possible to treat as much as 1000 acres, but usually a few hours in the early morning provides the only suitable flying weather. Many days will not be suitable at all and so the average is 200 acres per day.

2. The Stearman PT-17 aircraft that we propose to buy for Greece is about half the size of the T.V.A. dusting plane, but since it carries a larger "pay load" in the form of 20% DDT concentrate in Velsicol NR-70, it is believed that it can stay in the air longer with a load and will do as much per day as the larger plane using 5% Paris Green dust which must land frequently for reloading.

3. DDT is applied at a minimum rate of 0.1 pound, and a maximum of 0.5, pounds per acre, depending upon the type area treated and field conditions.

4. If one plane averages 200 acres per day for 50 days, 10,000 acres would be treated per season in the T. V. A.

Assuming that the Malaria season last twice as long in Greece as it does in the Tennessee Valley, one plane in 100 days would do 20,000 acres.

If treated with DDT at the rate of 0.1 pound per acre, 2,000 pounds of DDT per plane would be needed per season. If treated at the rate of 0.5 pound DDT per acre 10,000 pounds would be needed per plane per season.

The mean would be 6,000 pounds of DDT per plane per season.

Ten planes would use 60,000 pounds of DDT per season if they were all kept in perfect flying condition for the entire season. Since this is unlikely, it is believed that 40,000 pounds of DDT, dissolved in 20,000 gallons of Velsicol AR-70 to make the required 20% DDT concentrate, is required for the proposed airplane malaria control program in Greece.

5. All of the malaria control work can not be done by aircraft. They will need DDT for residual house spraying and for small scale hand applications as a larvicide. For this purpose, it is suggested that 20,000 pounds of DDT be mixed here and sent over as a 35% DDT emulsion concentrate. For a solvent Xylene is recommended but Velsicol AR 40, or 50; or Dupanol 74 or 75 can be substituted. Five thousand and forty (5,040) gallons will be needed to get 20,000 pounds of DDT in a 35% concentrate solution. Three hundred and twenty (320) gallons of Triton L-100, or Dupanol OS will be needed as an emulsifier for this amount. A workable formula is as follows:

125 pounds DDT		20,000 lb. DDT
31.5 gallons Xylene (Solvent)	or	5,040 gallons Xylene
2 gal. Triton L-100 (emulsifier)	total	320 gallons Triton L-100

35% DDT concentrate.

One (1) part of this emulsion concentrate can be diluted in the field with thirteen (13) parts of fresh or salt water to make the desired 2½% spray solution.

Request for Procurement:

It is requested that the following items be procurred and shipped to Greece as quickly as possible.

1. Ten (1) Stearman PT-17 airplanes equipped with thermal aerosol generators.

2. Sixty-thousand (60,000) pounds of DDT.

   (a) 40,000 pounds to be sent over as a 20% DDT concentrate in 20,000 gallons of Velsicol NR-70.

   (b) 20,000 pounds to be sent over as a 35% emulsion concentrate mixed with 5,040 gallons of Xylene and 320 gallons of Triton X-100.

3. Two-hundred (200) Hudson Industrial, 4 gallon, open head sprayers with oil resisting hose, washers and gaskets.

4. Four-hundred (400) spray nozzles No. ½-T-8002 from Spraying Systems Co., Chicago.

5. One thousand (1000) hand sprayers Hudson Capitol or equal with coarse, medium, and fine nozzles.

This matter has been under discussion since 9 March 1945 upon receipt of telegram number 38 from Mr. Hendrickson in Athens.

The Malaria plan for Greece has been approved by the Greek Health authorities and by UNRRA's Medical Officer and Sanitary Engineer in Greece; and the Director of Health, Chief of Supply and the Director General here. It is requested, therefore, that at least five planes be procurred and equipped here immediately with thermal aerosol generators pending investigations as to buying and equipping the other five in Italy.

The Hudson Industrial and the Hudson Capitol sprayers requested above are in addition the knapsack sprayers and others that may have been sent to Greece.

9 February 1945

To: W. A. Sawyer

From: Gerden E. Smith

Subject: Transmittal of D.D.T. Reports

The following D.D.T. Reports (some restricted information) are transmitted herewith:

1. "D.D.T. for Relief and Rehabilitation." (21 pictures)
2. "Tests With An Exhaust Aerosol D.D.T. Generator on a 450 H.P. Stearman Aircraft." (Drawing of blueprints attached.)
3. "Observations on the Use of D.D.T. for the Control of Anopheles Quadrimaculatus." (Illustrated)
4. "Direction for Use, and A Discussion of Insecticides and Repellents Investigated for the Armed Forces at the Orlando, Florida, Laboratory."
5. "Use of D.D.T. as Insecticide to Kill Adult Mosquitoes."
6. "Portable Hand Power Spraying Equipment for Use in Spraying D.D.T. Water Emulsion on Interior Surfaces of Dwellings and Other Buildings as an Experimental Malaria Control Measure." (Blueprint attached)
7. "Detailed Operating Instructions for Dry Ice Pressure Insecticide Spraying Unit." (Blueprint attached)

Time Magazine for February 12, 1945, stated that "Surgeon General Thomas Parran last week made his annual report to Congress on the state of the Nation's health.....and that some of the U. S. Public Health Service's malaria research was so sensational that findings 'cannot be reported until the War's end'".

By making full use of these "sensational findings", UNRRA's Health Division will make a great contribution toward relief and rehabilitation.

G.E.S.

GESmith:gk

UNRRA

SANITATION SECTION

Empire St. Bldg. 33rd Floor Mr Dauch

Ind. Rehab. on pipe & ftgs. Wells Rm 1130

SUPPLIES

EQUIPMENT AND MATERIAL

AS OF 31 OCT 46

A. FOR GENERAL SANITATION

Hoffman 828 Transp. Anderson Mat'ls Mr Boyle 113 Coutroubus ADam 9171 Greek Purch Mission

Description	Unit	Price	APPROVED Quantity	APPROVED Value	RECEIVED Quantity	RECEIVED Value	TO BE RECEIVED Quantity	TO BE RECEIVED Value	REMARKS
I. WATER SUPPLIES									Proc. Shipped as of 15 Nov
Pumps									
Force, windmill	ea.	65.-	200	13.000	-	-	200	13.000	150
Diaphragm gas.eng.100 gpm.	ea.	500.-	6	3.000	-	-	6	3.000	
Jack, Gasoline driven, deep well 30 gpm.	ea.	350.-	80	28.000	-	-	80	28.000	
Deep well 70 gpm.	ea.	1.500.-	50	75.000	- 6 IR	-	50	75.000	
Deepwell 2" to 6" g.o.d.	ea.	1.500.-	150	225.000	-	-	150	225.000	
Deep well 250 gpm.	ea.	1.500.-	50	75.000	8 (4 IR)	12.000	42	63.000	
Hypochlorination Units									
Pumping and portable 50 gpm.	ea.	500.-	46	23.000	46	23.000	-	-	
Filter Wallace A14 type 55 gpm.	ea.	2.352.-	6	15.112	6	15.112	-	-	

Description	Unit	Price	APPROVED QUANTITY	APPROVED VALUE	RECEIVED QUANTITY	RECEIVED VALUE	TO BE RECEIVED QUANTITY	TO BE RECEIVED VALUE	REMARKS Proc	REMARKS Shipped
Electric operated	ea.	300.-	130	39.000	-		130	39.000		
Chlorinator gas.300gpm.	ea.	852.50	20	17.050	-		20	17.050		2a
Hypo unit hand op.2g/m.	ea.	145.-	7	1.015	-		7	1.015		
Hypo unit hand oper 1g/m.	ea.	100.-	5	500	-		5	500		5
Welldrilling										
Well drilling outfit	ea.	11000.-	6	66.000	2	22.000	4	44.000		
Casing. deep well 8"	ft.	2.50	6.000	15.000	2500 - 8" 1100 - 12" IR 4745	9800 8" 11.862.50	1255	3.137.50		
Casing. dee well 6"	ft.	0.77	6.000	4.620	-		6000	4.620.-		
Shoes. dee. well drive 8"	ea.	30.-	55	1.650	IR 8-8" 2-12	320	55	1.650		
Shoes. deep well drive 6"	ea.	20.-	55	1.100	-		55	1.100		
Screen.deep well 8"	ea.	30.-	55	1.650	20 - IR 10-8" 10-12	9000 600.-	35	1.050		
Screen. deep well 6"	ea.	20.-	55	1.100	-		55	1.100		
Water tanks										
Tanks. water storage. steel or wood 10.000 gal.	ea.	362.-	50	18.100	-		50	18.100		
Tanks. wood stove 5000gal.	ea.		100		-					
Canvas tanks 3000 gal.	ea	154.-	10	1.540	10	1.540	-			
Lister bags	ea.	10.-	1.000	10.000	1202	12.020	-			1000

Description	Unit	Price	APPROVED Quantity	Value	RECEIVED Quantity	Value	TO BE RECEIVED Quantity	Value	REMARKS
Pipes with couplings									Prec. Shipped
Pipes with couplings 3/4	ft.	5.43/100'	20000	1.086	11.400	619	8.600	467	
" " 1"	ft.	0.10	20000	2.000		-	20.000	2.000	
" " 2"	ft.	16.57/100'	75.000	12.427	3.000	497	72.000	11.930	
" " 2.1/2"	ft.	0.45	75.000	33.750		-	75.000	33.750	
" " 3"	ft.	0.80	20.000	16.000		-	20.000	16.000	
" " 4"	ft.	1.00	10.000	10.000	3.300	3300	6.700	6.700	
Elbows e.t.c.				1.421		-		1.421	
Requested 1946 with valves and fittings 3/4" - 4"	ft.		700.000	250.000		-	700.000	250.000	
Chlorine Comparators	ea	12.50	165	2.062.50	115	1.437.50	50	625	181
Orthotolidin	btl.	1.65	100	165	702	1.160.30		-	
Hypochloride Calcium	lb.	0.28	7.100	1.988	213.720	59.841.60		-	710
Hypochloride Calcium	amp.	2.5/ Box of 100	60.000	1.500	365.000	9.125.-		-	60000
Alum. Filter	lb.	0.28	20.000	5.600	39.843	10.396.-		-	20,000
Iron rods	ton.	30	20	600	20	600		-	
II. SEWAGE DISPOSAL									
Trucks, sewage 250 gal.	ea.	4.000	5	20.000		-	5	20.000	
Trucks, sewage 500 gal.	ea.	5.000	50.	250.000	2	10.000.-	48	240.000	

Description	Unit	Price	APPROVED Quantity	APPROVED Value	RECEIVED Quantity	RECEIVED Value	TO BE RECEIVED Quantity	TO BE RECEIVED Value	REMARKS
									Proc. Shipped
Iron sheets corrugated 6' to 4' gauge 25	ton.	100	8	800	-		8	800	
III. REFUSE COLLECTION AND DISPOSAL									
Truck, garbage 3 ton	ea	9.500	100	350.000	-		100	350.000	
Cans, corrugated galv. with covers 24 gal.	ea	3.75	5.000	18.750	312	1170	4.688	17.580	
IV. RAT CONTROL									
Traps, guillotine type	ea.	0.25	1.500	1.728	1152	288	576	144	
Cage type (traps)	ea.	2.50	576	1.440	576	1440	[illegible]	[illegible]	
Red Squill	lb.	2.-	20.000	40.000	17.000	34.000	8.000	6.000	26,900 300
Barium Carbonate	lb.	77.2/ton	2.000	77.20	2.804	108		-	
Fluoroacetate Sodium 1080	lb.	4.80/ 8 oz. can	50	480	50	480		-	
V. TYPHUS CONTROL									
Dusters									
Power small elect. Hudson	ea.	24.-	200	4.800	200	4.800		-	200
Cotton, Hudson Hato power	ea.	15.-	600	9.000	96	1.440	504	7.560	600
Hand Power	ea.	0.30	720	216	48	14.40	672	201.60	
10.% D.D.T. Powder.	[illegible]	[illegible]	[illegible]						
Powdre	lb.	c.10	203.000	20.300	197.305	19.730.50	5.695	569.50	25,056 602 cans

Description	Unit	Price	APPROVED Quantity	APPROVED Value	RECEIVED Quantity	RECEIVED Value	TO BE RECEIVED Quantity	TO BE RECEIVED Value	REMARKS
D.D.T. Cans 2 oz.	Can	0.03 0.08	62.736	2.868	34.358	1.500	28.378	1.368	Prev. Shipped
VII. DESINFECTION									
Shower Units 16 heads with desinfector	ea.	2.975	53	157.675	53	157.675			
Cresol	gal.	6.90	5.009	34.500	1.830	12.627	3.853	21.873	3938
Lysol	gal.	1.05	1.000	1.050			1.000	1.050	

B. FOR MALARIA CONTROL

Description	Unit	Price	APPROVED Quantity	APPROVED Value	RECEIVED Quantity	RECEIVED Value	TO BE RECEIVED Quantity	TO BE RECEIVED Value	REMARKS
Insecticides									
D.D.T. 100% Pure	lb.	0.50	533.100	266.567.50	333.000	166.500	200.135	100.067.50	686,287
D.D.T. 20% Solution	gal.	1.80	275.204	495.367.50	177.444	319.399.20	97.760	175.968.-	289,208
D.D.T. 25% Emulsion	gal.	1.80	256.000	455.400	59.778	107.600.40	193.222	347.799.60	171,583
Paris green	lb.	0.30	40.000	12.000	63.780	19.134	-		40,000 Cairo
Vaporicol	gal.	0.46	10.000	4.600	1.620	745.20	8.380	3.854.80	19,000
Equipment									
Airplanes	ea.	2.500.-	18	45.000	18	45.000	-		18
Parts and Supplies				33.644		33.644			
Tools etc.				5.484		5.484			
Sprayers									
Portable, Piston pumps 3 gpm.	ea.	350.-	58	20.300	95	33.250	-		340
Oil. knapsack 5 gal.	ea	11.-	3.030	33.330	4.535*	49.885			* different types
Hand pumps 1 pint # 412 Hudson		0.40	25.116	10.046.40	11.164	4.465.60	13.952	5.580.80	12907
Hand pumps(pressure type)	ea	1.25	1.412	1.765	1.412*	1.765			* different types

Description	Unit	Price	APPROVED Quantity	Value	RECEIVED Quantity	Value	TO BE RECEIVED Quantity	Value	REMARKS
Miscellaneous									Price Shipped
Pipe Brass	ft.	0.065	2.000	130	-		2.000	130	
Hose Oil resist.3/8"	ft.	11.25/100'	10.000	1.125	12.125	1.622.80	-		
Screen, wire, copper, bronze, monelmetal, g. iron japanned 16 mesh. 36" wide	yd.	0.05	28.000	1.400	-		28.000	1.400	
Netting, cotton, insect	yd.	0.15	50.000	7.500	37.000	5.625	13.000	1.875	49392
Goggles gas tight	pr.	1.95	1.500	2.925	1.000	1.950	500	975	
Gloves, Rubber	dz.	9.80	125	1.230	72	705.60	53	524.40	
Boots, rubber	pr.	2.92	400	1.088	1.814	5.297	-		400
C.Form TRANSCRIPT									
Trucks									
1 1/2 ton 4 x 2 pick up body	ea.	2.000.-	101	202.000	-		33	66.000	
3/4 ton	ea.	2.000.-			48	96.000	-		
1 1/2	ea.	2.000.-			20	44.000			
1/4 ton 4 x 4	ea.	1.360.-	134	182.240			134	182.240	
Motorcycles	ea.	350.-	75	26.250	75	26.250	-		

Description	Unit	Price	APPROVED Quantity	APPROVED Value	RECEIVED Quantity	RECEIVED Value	TO BE RECEIVED Quantity	TO BE RECEIVED Value	REMARKS
									Proc. Shipped
D. FOR SURVEY AND DRAWING									
Survey instruments									
Transit with tripod	ea.	260.-	20	5200	-		20	5200	20
Level with tripod	ea.	198.-	20	3960	6	1188	14	2772	15
Levels, hand	ea.	4.80	50	240	-		50	240	50
Tapes steel 20 m.	ea.	7.49	50	374.50	50	374.50	-		50
Tapes metallic	ea.	5.25	100	525	151	792.75	-		100
Poles, 6 rungs	ea.	2.70	50	135	-		50	135	—
Drawing instruments, pencils, paper etc.				862		862	-		812
E. MISCELLANEOUS TOOLS AND MATERIALS.									
Wheelborrws, shovels, picks, carpenter tools, dippers, nails etc.				11.500		3400		8100	

UNRRA

Sanitation Section

RECAPITULATION OF SUPPLIES

APPROVED AND RECEIVED AND TO BE RECEIVED

31, October 1946

Description	APPROVED $	RECEIVED $	TO BE RECEIVED $	REMARKS
A. GENERAL SANITATION	1.885.920.70	430.383.80	1.527.361.60	
I. Water supplies				
Pumps	419.000.00	12.000.00	407.000.00	
Hypochlor. Units	95.677.00	38.112.00	57.565.00	
Well drilling	91.120.00	34.462.50	56.657.50	
Water tanks	29.640.00	15.560.00	18.100.00	
Pipes and fitting	326.684.00	4.416.00	322.268.00	
MISCELLANEOUS	10.115.50	82.560.40	625.00	
	972.236.50	185.110.90	862.215.50	
II. Sewage disposal	270.800.00	10.000.00	260.800.00	
III. Refuse collection and disposal	368.750.00	1.170.00	367.580.00	
IV. Rat control	43.725.80	36.316.00	6.144.00	
V. Typhus contrl	37.184.00	27.484.90	9.699.10	

Description	APPROVED $	RECEIVED $	TO BE RECEIVED $	REMARKS
VI. Disinfection	193.225.00	170.302.00	22.923.00	
B. MALARIA CONTROL				
Insecticides	1.233.935.00	613.378.80	627.689.90	
Equipment	149.569.40	173.493.60	5.580.80	
Miscellaneous	15.398.00	15.245.30	4.904.60	
	1.398.902.40	802.117.70	638.175.30	
C. TRANSPORT	416.490.00	166.250.00	248.240.00	
D. SURVEY and DRAWING	11.296.50	3.217.25	8347.00	
E. MISCELLANEOUS TOOLS AND MATERIAL	11.500.00	3.400.00	8.100.00	
A. GENERAL SANITATION	1.885.920.70	430.383.80	1.529.361.60	
B. MALARIA CONTROL	1.398.902.40	802.117.70	638.175.30	
C. TRANSPORT	416.490.00	166.250.00	248.240.00	
D. SURVEY AND DRAWING	11.296.50	3.217.25	8.347.00	
E. MISCELLANEOUS	11.500.00	3.400.00	8.100.00	
TOTAL	3.718.109.60	1.405.368.75	2.432.223.90	

MALARIA IN GREECE AND THE USE OF DDT IN GENERAL

By Col. D. K. Wright, U.S.P.H.S.

Greece has a population of approximately 7.300.000, and its area is approximately the area of N.York State or 32.470.000 acres (129.880.000 stremmas).

Roughly 73% of its area is non-tillable and in many instances so barren that it will not raise goat food.

Since ancient times malaria has been one of its greatest curses, and has accounted in no small measure for its being unable to support itself.

Medical science has proven beyond doubt that malaria has been the indirect if not the direct cause of the high tubercular rate in the country, due to the general weakened condition of so many hundreds of thousands of people from the disease. Many other diseases are directly attributed to malaria and its after effects.

The program of mosquito and general insect control in Greece during 1946 has been one that has attracted the interest of the world, and much more will be heard of the work in the future than in the past, as the concrete facts of the results are only just being made known, based on scientific knowledge collected in the field and checked against similar surveys made during the winter of 1945 and 1946. We have ample proof of the effectiveness of the program from personal observations, clinical records and testimonials from thousands, from every part of the country.

We built our hopes for success by the use of DDT in Greece not on guess work, but by having made a careful study of the results obtained in the testing laboratories of the U.S. and field demonstrations on a small scale. With this knowledge thoroughly digested and checked we felt no hesitancy in making an all-out drive to control malaria in Greece and, where possible, eradicate the curse.

The plan we proposed seemed fantastic to those that had been working on control by the old measures which were expensive and required large numbers of trained men that were more or less schooled in the biology of mosquitoes, and assigned the task of specie control. The fact that a house or other haunts of men and beasts were swarming with mosquitoes was of no

importance, so long as there were no anopheline present. It was this type of mosquito control that failed to win the full support of the population, and made paris green a means of control tolerated, only because as a rule it was cheaper to apply than oil or other larvicides. No one would now use paris green as a control measure, unless in an emergency to cover a time when DDT could not be obtained.

There are those that are convinced that complete control of malaria is possible by the residual spraying of dwellings and outbuildings. A demonstration was made on a small scale in Italy this year, and the results were so startling that Prof. Messiroli announced that next year only residual spraying would be done in the country as a whole, as they do not have airplanes to care for large swamp areas, and he considers it a waste of money to tackle areas that can be reached by hand. It is my opinion that it is a little early to abandon anti-larva work entirely, regardless of the very effective results obtained from residual spraying, and this is especially so in Greece where there is so much valuable farm land on the edge of swamps. The great drawback to using DDT as a larvicide by hand is that no sprayer is yet on the market that gives a fine enough spray to use the material as economically as is possible to give results. The nearest approach that we know of is a Hudson pressure hand sprayer of a half gallon capacity, but even it uses twice the material required. The proper rate of application is one half pint to the acre (4 stremmas) for complete control. The old type of pressure sprayer with the best adjustment uses eight times this amount. The airplane using the thermal aerosol method uses between one half and one pint to four stremmas and careful check shows that spraying can be done for one thirtieth of the cost of hand spraying work, and more effectively.

It was the airplanes that made it possible to reach all of the more malarious areas of Greece this year, andwithout them the results obtained would have been impossible, not only for the control of mosquitoes but flies, sand flies, fleas etc. Greece is fortunate in having in its possession 17 planes

inexcellent condition, that with proper eare should render service for many years at little cost for maintenance and repair. The actual cost for labor, material and operating expense (maintenance and transportation) for the past season amounted to ten cents for one acre (four stremmas) and our average number of times for spraying the swamps of the country was seven. The number of times that it was necessary to spray the areas to get control was governed by the type of vegetation in the swamp areas. In rice paddies for example we sprayed every 15 days to keep them free of mosquitoes. The fact that this is possible means a great deal to the country from an economical standpoint, as by controlling mosquitoes it will make it possible to increase the production of rice many times in the country and provide badly needed extra food. There are laws on the statute books at present that prohibit the growing of rice within specified limits of villages, as is the case in many countries. Reports from America this year state that the spraying of rice paddies by DDT from airplanes is so satisfactory, as a means of controlling mosquitoes, that people are assured that it is quite possible to plant rice as close to their houses as they may desire, with no danger from mosquitoes.

In any discussion of the use of DDT it would be a mistake to confine its value to malaria control only, as this is only one of its benefits to mankind. Those familiar with conditions during and after world war I know what happened in various parts of the world from the effects of typhus. It has been estimated that in Russia alone ten million people died from this disease. In Serbia hundreds of thousands died, as was the case in other parts of the world. During and since this war, typhus has been of little importance, and the credit can be very largely given to DDT. In Greece during the past two years well over a half million people have been deloused by the use of DDT and cases of typhus have been kept at a minimum.

By destroying flies over a large part of Greece this year the Medical profession from all parts are commenting on the reduction of diarrhea, dysentery, typhoid and other intestinal diseases, especially among children. It is predicted that statistics will show a marked decrease in infant mortality.

There is a strong belief among many doctors that the number of cases of pneumonia will show a marked reduction especially in the villages this winter.

There is little definite scientific data to substantiate the fact that new cases of trachoma have very materially decreased in villages where it is very common, but clinical data available shows this to be the case in villages where flies were eradicated by DDT, and we hope that the matter will be thoroughly investigated and definite proof furnished.

That Kalaazar has been reduced in sprayed villages there is no question.

Sand fly fever has been very materially reduced if not eliminated in many areas.

Dengue fever during the past year was not found in villages where all houses were sprayed, and was reduced where general control measures were used. It is interesting to note here that among the imported personnel of UNRRA in 1945 between 50 and 75% had dengue or sand fly fever, while in 1946 the percentage dropped to between 5 and 10, with not one new case of malaria.

No one questions the satisfaction to individuals that were freed for the first, in their lives of the plague of bed bugs and fleas; no one to my knowledge has ever attempted to compute the over-all damage to mankind, caused by the loss of blood and the loss of a comfortable night's sleep by bed bugs and fleas. No doubt this plays a greater part than was realised in many ways in the general health of man.

Agriculture is realising the full value of DDT more and more every day, and during 1946 factories were not able to supply the demands for different mixtures in the United States. In Greece we were only able to demonstrate its use in a very limited way as a control of the Dakus fly. Approximately 30.000 acres (120000 stremmas) were sprayed. Where the work was done under favorable conditions the results were excellent, and we predict that in due time it will come into universal use, at an enormous saving to the country.

We also sprayed small areas to control the tent moth that is so damaging to pine trees. This proved 100% effective, as was the case of one kind of aphis on apple trees, as well as coddling moth.

Attention is called to the above to show that in figuring costs, many factors should be taken into account. For example, it is very easy for one to point to the drain on a country to support a thorough malaria control program, and fail to point out the many things there are to offset this cost, such as the cost of quinine, atebrine, man days loss from work, hospital beds occupied, medical care, the general weakened condition of the malaria victims, which makes them susceptible to many other diseases, and the multiple other benefits that are now possible by the use of DDT as the agent for controlling malaria.

That the campaign waged in 1946 in Greece has been successful, even the most pessimistic will concede, but we that fought so hard to get the program under way and keep it going know that it could have been even more successful had it been possible to avoid many of the obstacles with which we had to contend. Lack of adequate and well trained personnel, lack of material, lack of transport, many cases of friction due to dual control or rather handling of work in the Regions as set up by UNRRA, all of which caused delays and in many instances increased cost.

We believe that while it would be very difficult to accomplish, it would be possible to carry out an over-all insect control program in Greece at a cost far below what it cost us this year, and in a more efficient way, if authority is given by the Ministry to build and maintain the right kind of an organization free from political interference, and composed of men trained for their work and employed at a living wage.

It is unfortunate that at this time it is not possible to produce concrete evidence from a scientific standpoint the results of our malaria control work by comparative charts and graphs, as the over-all survey is only just being made, and it

will take time to examine the thousands of blood samples taken to determine the parasite index, and plat the spleens etc. The field reports indicate that we will not be disappointed in our expectations.

It may be of interest to quote the conclusions we arrived at and submitted to the Chief of Mission UNRRA for his report to Washington :

1. In spite of all obstacles, UNRRA did a creditable and valuable piece of work in Greece from a general sanitation standpoint.

2. A plan of mosquito control on a scale never before attempted was put into effect, with results far beyond the expectations of the most optimistic.

3. A clear-cut demonstration was made of the fact that, with the use of DDT in a proper manner and under good supervision, it is possible not only to control malaria but to eradicate mosquitoes and insects of all kinds that affect or are a nuisance to mankind.

4. Residual spray in houses, when applied in the proper manner and right strength, will notonly destroy mosquitoes but all other insects that infest houses and other outbuildings, such as flies, bed bugs, fleas and sand flies.

5. By the thermal aerosol method of applying DDT by airplane it is possible to completely control mosquito breeding in swamps at a remarkably low cost for material and labor, and without dangerous effect on fish or other aquatic life.

6. Since it is possible under normal conditions to do the work with one plane of six thousand or more men effectively, with a third of the material used by hand spraying, this method of mosquito control should be universally used, as the rather high initial cost for the plane is soon compensated for when work is done on a large scale.

7. It was clearly demonstrated that one man could with ease care for as much as 17 miles of mountain streams with a pressure hand sprayer of half gallon capacity. A quart bottle of 26% emulsion in his

pocket or a small shoulder bag, in addition to his loaded sprayer, will provide him with material for a ful day's work. This very largely solves the transportation problem.

8. In spraying houses or other buildings the slot or what is called the brook spray nozzle should be used. This gives a uniform coat of 200 mg. per sq. ft., does not waste material, and speeds up the work.

9. The results of many experiments showed that a 5% DDT solution was the most effective and economical mixture to use. Less did not last, and there was no noticeable advantage in using more.

10. The surface sprayed in houses and outbuildings may show quite a difference in so far as results are concerned, due to their general texture and condition. Care should be taken to see that heavy coats of dust and cobwebs are removed. Glazed surfaces or others that do not permit penetration may result in the DDT sloughing when the solvent evaporates. We have perfect examples where the spraying has been effective for three hundred plus days, while in others respraying was necessary in sixty days or less.

11. The lasting effect of the thermal aerosol spraying by plane largely depends on the general nature of the growth in the swamp. We sprayed areas that were heavily infested, with perfect results for as long as 45 days; others required re-spraying after 15 days.

12. To get perfect control in thick rice paddies we sprayed every 15 days.

13. For experimental purposes we sprayed a number of villages, street by street, with such good results from the standpoint of fly, flea and sand-fly control, that we believe it should be done in all villages at intervals, where bees are not kept that feed on the blooming flowers.

14. Where judgment is used, there should be no serious loss to bee raisers. Repeated tests proved that during the past season.

15. It was thoroughly demonstrated that the village people will gladly provide the required labor for doing residual spray work in their villages, if material and spray material is provided. This plan should be strictly followed in next year's work.

16. Where from one half to a pint of 20% DDT in Velsicol per acre is used for spraying around the edges of lake areas, no fish were killed.

17. Where DDT is used intelligently, there is no danger to man or beast, and it is by far the most economical and effective insect control drug that has been put on the market to date, and one can truthfully say it is the answer to a sanitarian's prayer.

Too much credit cannot be given to all of those who took an active part in the insect control program that was carried out in Greece during 1946, for the results obtained were only possible by the untiring effort on the part of all concerned.

We were given whole-hearted support by the many Ministers of Health, with one unfortunate exception, but this Minister not only attempted to destroy the malaria control program, but every other phase of public health. We were given full and complete cooperation by the General Director of Health and by the Chief Malariologist of the School of Hygiene and his assistants, with few exceptions. DDT was completely new to all the force, and it was no more than natural that doubters and pessimists would be found, but it is safe to say that there are few left, after witnessing the results in Greece this year. It is our hope that the program can be carried on and even better results obtained next year.

Let us hope that nothing will occur to prevent Greece from taking advantage of the good results this year by continuing the new method of malaria and general insect control, and relieve itself once and for all time from the curse of past centuries. The people of the country can be sure of one thing, and that is that I will do everything in my power to ensure the program being carried on.

P.S. The report that mosquitoes have built up a tolerance to DDT in the past few years, is far from being proven to my satisfaction if applied properly & if the D.D.T. is of the proper strength & my own tests show that where the pure D.D.T. is used a 100% result is obtained, while the technical grade will not give the same results. D.E.S.

GENERAL SANITATION

While malaria and general insect control was our main problem, we by no means neglected general sanitation. As could be expected, this work had for the most part been completely abandoned during the war and occupation period. There was no material available to take care of maintenance. Pumps and engines were in many cases completely out of commission due to lack of spare parts. Chlorinators had long since ceased to work, though lack of maintenance and chlorine. The bodies had been removed from garbage trucks, and the chassis used for other purposes. There was scarcely a city, town or village in the country, from which garbage had been removed for months on end. Hospital garbage bins and yards were overflowing with garbage of all kinds in various states of putrefaction. From one hospital in the city of Athens, we removed seventeen 3-ton truckloads of garbage and refuse. Other hospitals and public buildings had similar amounts on the premises.

Typhoid which is endemic throughout the country had in many cases reached the epidemic proportions, and it was a case of distributing chlorine as widely as possible and improving as many bad spots as we could get at and material available would permit.

A systematic survey of the villages was made in the different regions to determine just what the conditions are. A bacteriological examination of the water supply of 2100 villages showed sixty percent contaminated, 24% questionable and 16% pronounced good. This is a very bad showing in any country, and will require a long time systematically worked out program to correct. U NRRA would have been able to accomplish a great deal more than it did to improve water supplies, had it been possible to obtain supplies of pipe, pumps, well drilling equipment, tools etc.

The country has always been notorious for its lack of proper means of disposing of fecal matter. Modern sewer systems and disposal plants simply do not exist. Even in the city of Athens-Piraeus, with a population of over one and a half million, less than 10% of the population is provided with a sewage system. Cesspools, and septic tanks are

depended on for disposal of fecal matter, and the saturation point has been more than reached, causing a rise in the water table which has resulted in the flooding of many basements and a thorough contamination of wells in and around the cities. Some day, and it may be soon, these cities are going to pay a very serious price from a health standpoint for this lack of sanitation. There are hundreds of cesspools and septic tanks overflowing to-day in various parts of the city and suburbs, causing foul odors and a serious fly nuisance. Knowing the conditions beforehand, we programmed a large number of trucks equipped with tanks and sewage pumps for emptying these cesspools and septic tanks, but only two have so far been delivered of a total of 25 programmed.

In the rural areas special effort has been made to protect springs and wells from surface contamination and to encourage the construction of as many latrines as possible.

The fly problem, always a serious one in Greece, has been very largely solved this past year by the use of DDT. This has been so successful in many places that it is considered a miracle by many. The large cities, like Athens, Piraeus, Salonica, Patras, Kavalla and others, were kept almost free by the systematic spraying of dumps, areas around slaughter houses, and other large scale breeding places of flies. This fly control has resulted in a very marked reduction in the number of cases of diarrhea, dysentery and other intestinal diseases, especially among children.

The sanitary problem of freeing the residents and population of lice, bed bugs, fleas, sand flies, house flies, cockroaches and other insects has been a big undertaking but to a very large extent has been accomplished in conjunction with the malaria control work. We have received the enthusiastic thanks of people throughout the country for making it possible to be comfortable in their homes for the first time in their lives.

General Sanitation in Greece presents a real problem and can only be solved in a proper way by a long time program, systematically worked out, and the expenditure of a large sum of money. Large sums have been spent in

the past, but for the most part wasted, due to makeshift measures being employed and rank lack of practical experience on the part of the Engineers planning the work.

While the forces of UNRRA did everything possible to relieve real emergency sanitary problems, the work done was far less than could have been hoped for due to lack of material and equipment, much of which is now being received and, according to advice, will be in course of delivery up to March 1947. If the material programmed and purchased by UNRRA is properly disposed of, when received, it will go a long way to relieve the most urgent problems in the country.

Crete will become a paradise.

New York. 25/2/48 (from our own correspondent).

The Rockefeller Foundation will prepare plans that will make Crete an island paradise and a model of self-supporting area. From reports, following an invitation by the Greek Government, experts of the Foundation will visit Crete in March to consider the carrying out of a long-range program of economic development. The required funds will be made available by the Rockefeller Foundation but the Island of Crete will also participate financialy in the proposed work.

The plan for the island was recommended by Col. Daniel Wright, Sanitary Engineer of the Foundation, and was approved by the Foundation last fall, but it was only a week ago that the Greek Government accepted the offer.

The plan will cover public health inprovements and economic development. If it proves, successful, the program will be extended to other areas of the country.

Col. Wright believes that, when properly developed, Crete will be able to take care of a population of 7000.000, that is equal to the population of the Island in ancient times.

A BRIEF REVIEW OF MALARIA PROBLEM

AND MALARIA CONTROL ACTIVITIES IN MODERN GREECE

By Dr. Gr. Livadas
Nov. 2, 1945

Ever since prehistoric times, if we are to accept the opinion of certain writers, but most assuredly since Hippocrates period, malaria has been ravaging this country, becoming at times, under the existing climatic and meteorological conditions and the relevant social and political changes, of a more orless menacing character.

In modern times, the study of malaria conditions in Greece, the collection of statistical data on malaria morbidity and mortality, and the carrying out of minor drainage projects as a malaria control measure, were inaugurated about 40 years ago by two prominent workers Prof. Savvas and Dr. Kardamitis. The first attempt to enlighten the general public on the malaria problem and the proper use of quinine by the afflicted population of the country was also made by the same workers through the establishment of the "Association for the control of Malarious Diseases" in 1905.

The presence of allied armies in Macedonia during the first world war, which suffered severely from malaria, offered the opportunity for a great many foreign doctors, serving in the army, to investigate more closely the malaria problem in Macedonia. In this connection, the works of Wenyon, Sergent, Armand, Delille, Foissenu, Lemire and others are worthy of note.

In 1922, there was a high malaria incidence in this country, especially in Macedonia and Thrace. The mass arrival of 1,500,000 refugees, mostly coming from endemic regions of Asia Minor, their speedy settlement and the disturbance of the economic condition of country, caused by the previous long war period, greatly contributed to this epidemic outbreak of malaria.

The Government and various institutions, such as the Greek Red Cross and the Refugee Settlement Commission made great efforts at the time, for the treatment of the malaria afflicted population.

In 1928, the carrying out of major drainage works in Northern Greece was started, with the main object of reclaiming large swampy areas and making them available for cultivation, and improving at the same time the general health conditions in that part of the country.

During that period, agreat number of Greek scientists (Koutoussis, Livieratos, Bonsis, Sotiriadis, Petakis, Aravantinos etc.) published several interesting studies on the clinical aspects and the treatment of malaria, and in 1930 a special Malaria Control Service of the Ministry of Health was for the first time established, which for various reasons failed and was after a short time abolished.

However, it was only in 1930 that a systematic study of malaria epidemiology in this country and the first experimental tests of the various malaria methods were started by the establishment of the Malaria Division of the Athens School of Hygiene, assisted by the Rockfeller

Foundation Mission that arrived in that year in Greece.

The assistance of the Foundation scientists (Barber, Balfour, Rice, Shannon and Wright) in the study of malaria problem in Greece and in the testing of reasonable methods for its handling, was indeed very valuable.

The same workers determined the existing varieties of A. Maculipennis in this country, the geographical distribution of anopheles species and the distinctive character of their breeding places. The biology of the various anopheline species in Greece was carefully studied and the importance of each of them as malaria carriers determined.

Moreover, the various species of malaria parasites were studied, also their seasonal distribution and the effect of the various malaria drugs on the local strains, so as to make it possible to determine the most efficient methods of treatment. In addition, through the systematic taking of malaria indices throughout the country by the Malaria Division of the School, it was possible to accurately determine the extent and intensity of malaria phenomenon in Greece, and the check-up by the same Division on the experimentation of malaria control methods.

This experimental work resulted not only in the establishment of the degree of efficiency and adaptability of each method, as well as the details of their application, but in the popularization of malaria control measures after the local authorities were convinced of the real value and importance of these methods and consequently of their obligation to assist financially in applying the necessary control measures.

In addition, as these measures developed, the opportunity was offered for the malaria personnel to receive special training in malaria research and control and be able to carry out the necessary control measures in each particular case.

A brief outline of malaria problem in Greece, after the short account given of activities to date, is as follows:

1. Malaria is prevalent throughout the country, with the exception of a small number of mountainous or insular areas and certain urban centers.

2. Of 11,000 villages, approximately 6000 have a serious malaria problem, expressed by a spleen index ranging between 25 and 100%.

3. Average malaria death rate 5000 per year. Number of malaria cases 1 - 2,000,000 per year.

4. Number of lost working days due to malaria 20-40,000,000 per year.

5. Average quantity of quinine yearly consumed 29,981 kilog, valued at 75,402,215 pre-war drachmae.

6. Prevalency of all three malaria parasites, with falciparum predominating in summer and autumn and vivax in spring. Pl. malariae in relative proportion throughout the year, especially in winter. Mixed infections very frequent.

7. Species responsible for malaria transmission in order of importance: Elutus, superpictus and maculipennis.

5. The most important breeding places for malaria-carrying species: small or large swamps, the existing numerous streams in the country, and the various collections of standing water which are mostly due to the lack of any control of running waters.

In 1937, at a timew when by the above work the general public in this country had already become fully alive to the necessity of adopting a systematic program of malaria control measures, the Malaria Division of the School of Hygiene was authorised by the Ministry of Health to organise a general malaria control program and was furnished the necessary funds for the purpose.

Under this program, gradually developing, there were 15 malaria stations in 1937, that gave protection to 400,000 population, mostly urban, 38 in 1938 with a protected population of 600,000 and 73 in 1939 that took care of 900,000 population.

The increased protection during the years 1938 and 1939 mostly covered rural population.

The funds appropriated by the Ministry of Health for carrying out this program amounted to 6,000,000 Drs. in 1937, 10,000,000 in 1938, 14,500,000 in 1939, and 18,000,000 in 1940.

Local malaria projects were, at first, based on larva control work by Paris green, combined with the adjustment of all breeding places in the area and their stocking with gambusia. At the same time, the question of draining the breeding places with a view of completely eliminating or reducing their number, was given consideration, so as to facilitate larva control work and cut down the expense involved to a minimum. The final end in view was to make the further carrying out of the simplified project a responsibility of the local authority.

The general program also included the treatment of malaria patients, especially in areas where it was not possible to take more drastic measures at the early stage of malaria control activities. In 1939, there were [illegible] malaria dispensaries functioning, that took care of a population of 217,000, and, in addition, free quinine was dispensed by the local communal committees to indigent malaria patients, under the supervision of our service and of the local public health centers. Under this scheme the following quantities of quinine were distributed throughout the country: 3,654 kilos in 1937, 3,251 in 1938, 2,7[illegible] in 1939. The program also included the screening of houses for demonstration purposes, the distribution of gambusia by special flying squads to the various water collections, and the propagation of malaria control measures among the population.

Field work under this program was carried out by the malaria control doctors Lazaris, Belios, Fameliaris, Triandafyllides, [illegible], Dinos, Chapis, Vlastos, Zafiropoulos and Pournaropoulos, by the field laboratory assistants Dr. Kanellakis, Dr. Valla and Dr. Savva, by the Technicians Mrs. Vafiopoulou and Miss Dephanian, 42 malaria dispensary doctors, 113 sanitary inspectors and foremen, and the necessary labor force. The prefectural public health centers also assisted in carrying out this program. As a result of this work, there was a complete interruption of malaria transmission in certain areas and a considerable reduction in others. Detailed information of the foregoing, with the necessary statistical data, is given in our book "Malaria in Greece", published in 1940, in

ecoperation with our collaborater Dr. Spanghos.

The calamity that came upon the country naturally upset the progress of the malaria w rk started. Part of the field personnel, caught in the whirlwind of tragic events, perished, and the others headed for the capital and other big cities.

Most of the malaria equipment and material was lost. Malaria, assisted by ideal conditions created by the general chaos prevailing in the country and the abandonment of the fields, continued its work almost uninterruptedly. The malaria indices for that period are an eloquent evidence of this.

These were the conditions existing at the time of the arrival here, a few days after the liberation of the country, in the fall of 1944, of our old friend and collaborater Col. R. M. Wright, Chief Sanitary Engineer of UNRRA Greece.

One of our main efforts naturally was to undertake jointly the reorganisation of the malaria control service, and the establishment at the same time of a special sanitary service for rural areas, working in close cooperation with the former. The program outlined was approved by the General Director of Health Dr. Kopanaris and finally by the Minister of Health, and was put into operation in April last.

Under this program, the country was divided into 10 regions, with a malaria doctor, a sanitary engineer and 15 sanitary inspectors and foremen assigned to each region. A number of American Sanitary Engineers were made available by UNRRA, mainly for the purpose of training the Greek engineers in field sanitary work and assisting the malaria control service. The labor force that would be required in carrying out the program would be employed locally.

The Ministry of Health took care of the necessary expenditure to pay the salaries of the personnel and the wages of day laborers as well as any other administrative expenses. The amount budgeted this year by the Ministry for this purpose is 104,125,600 drachmas.

At the same time UNRRA agreed to make available the necessary larva control material and equipment, and provide transport for personnel and material.

The Malaria Division of the School of Hygiene, in cooperation with Col. Wright, undertook the entire supervision of the malaria control measures provided by the program.

The larva control projects worked out for this year amounted to 159. In the meantime, as DDT arrived in quantities from the United States, the malaria control work expanded to new areas by dust spray. The number of villages where this work has been done to date amounted to approximately 297.

It should be noted that the British Military Authorities assisted in many ways in carrying out this program.

Col. Gavin, Officer commanding the Army Malaria Field Laboratory will give a detailed account of the activities of the English Sanitation Service.

As yet, there are no sufficient data to show accurately the results of malaria control activities this year. Such data will be available when malaria indices in the areas protected are taken and are compared with the indices of unprotected areas.

On basis, however, of certain data, as the average weekly anopheline catches and the morbidity returns, where such are available, we can from now gather that, in spite of unavoidable delays and handicaps (shortage of transport etc.) the results obtained from the work done to date have been very satisfactory.

In estimating the results the fact must not be ignored that malaria incidence during this year has generally been very low, except for certain areas.

Worthy of special note have also been the results from the use of DDT in adult control. This method of adult control, which in other countries gave satisfactory results even by the old insecticides, was for the first time this year experimented on in this country by this most effective new insecticide.

It is believed that by expanding and systematically applying this method, malaria control in Greece will enter a new phase in which one can visualise, if not the complete elimination of malaria, within the next few years as some of us, superoptimists, are inclined to believe, at least the upsetting of existing malaria conditions in this country and such a reduction of malaria that it will cease to be public health enemy No. 1 in the future.

From the general application of this method there will be some more favourable results obtained, such as the control of other insect-borne diseases (three-day fever, dengue fever, leismaniasis etc.) and a general improvement of living conditions for the rural population by the elimination of the existing numerous domestic insect pests (fleas, bedbugs, lice etc.)

By the addition of this method malaria control work will not only assume a general character, but will meet the enthusiastic cooperation of the protected populations; and this is really one of the greatest advantages derived from this method.

In contrast to the slow results obtained from the old malarial control methods, for the success of which not only hard and long efforts but constant propaganda among the population was required, the quick and evident results by the new method can readily serve as an eloquent argument for malaria propaganda.

These facts show beyond any doubt that the DDT method will be in future the basis of our malaria program, with no exclusion of course of the other malaria control methods or disregard of the importance of drainage projects whereby suitable land is reclaimed and the living standard of the rural population raised.

In addition, the proposed treatment of large swampy areas with DDT from aeroplanes will add more impetus to the malaria campaign.

In this connection, I would like to point out that in order to attain the object in view, in addition to the equipment, material etc., so liberally furnished our service by UNRRA, it is very necessary that the existing service be properly developed for handling these supplies.

It is therefore necessary that due consideration be given to the various problems involved in the employment and training of new personnel, their salary and maintenance, transport facilities to be provided for them, and the adjustment of existing economic system in such a way as will make it possible for the necessary funds to be made available without detrimental delays. We are confident that these problems will be disposed of satisfactorily during the winter interval, which will be used as a preparatory stage, and that the next spring will find everyone ready for the big malaria drive.

We feel warranted in expressing this feeling of confidence by the keen interest of all UNRRA officials, the enthusiasm and whole-hearted cooperation of the Chief of UNRRA Sanitation Section Col. Wright, the incompamble interest shown by the British Military Authorities, the deep appreciation shown by the competent officials of the Ministry of Health and by the intense willingness and self-sacrifice of all the personnel of the malaria control service.

M A L A R I A past and present in Greece.

Volumes have been printed through the years and more will follow on the effect and prudence of malaria in Greece. Definite facts born out by statistics compiled over a long period of time are not available, but there is ample proof furnished by clinical records and, spot checks to verify the fact, that malaria has since ancient times been one of the countries worst plagues and has played no small part in retarding general progress.

It was not until by a special request of the Prime Minister E. Venizelos to the League of Nations for a special committee to investigate, and report on the seriousness of the problem that it was given international prominence.

The report to the committee sent to Greece was of sufficient scope to convince the Prime Minister that steps must be taken to handle the problem without further delay, and a formal application was made on the Rockefeller Foundation and the League of Nations to send a mission to perform two tasks, one to establish a school of Hygiene for the purpose of training Public Health officers and the other to make as complete a survey as possible of the country to determine the intensity of Malaria and determine vectors in the country and their relative importance.

The invitation was accepted by the Foundation and the League of Nations and at first three men were sent, two from the Foundation and one from the League of Nations. At a later date three additional men were added to the Foundation team. One of the first tasks of the Foundation was to pick a number of likely candidates for fellowships to the U.S. The first group were sent in the Fall of 1930 there were followed in succeeding years by others, which resulted in building up a force capable of coping with the many Public Health, malaria and sanitary problems of the country. Unfortunately for the service, a large number of those trained were lost to the service, shortly after their return, due to the extremely low salaries paid by the Government as well as a lack of opportunity for advancement. Fortunately the group given a special training in malaria control were young and enthusiastic, and on their return were assigned to work with the Rockefeller Foundation experts, for their practical field training, and at the same time

were given a living allowance, by the Foundation that made it possible to get along. These men during a period of seven years were able to make a most thorough, and complete survey of Greece as a whole, to determine the species of Anopheline mosquitoes in the country and their relative importance as malaria vectors, their breeding habits etc. etc. While the survey was being carried out a number of demonstration areas, were picked out in different parts of the country, and various methods of malaria control applied, such as drainage larvaeiding by the use of dust and"paris green" later"paris green" especially prepared for use in water application, and the old tried and proven method of oil, screening of one village was carried out, gambusia were distributed in various swamp areas and in streams where there was a light grade. These little workers were also placed in many shallow wells, decorative ponds and other pools. In addition to these mosquito control measures, villages were chosen where profilactic treatment alone was applied, and control villages where no work of any kind was done were carefuly observed to determine the relative value of methods applied.

It was by this method that aworking crew of Malariologists, Entomologist and Inspectors were built up to handle the malaria problem, by what was then t the best known methods. As stated before the entire malaria force were trained from the ground up, and proved themselves enthusiastic and energetic workers, anxious to carry on a control program, for the country. Unfortunately as the program set up, by the Foundation was largely a research one, it was not as well rounded out as might have been hoped for, from the stand point of general control.

In 1937 the most likely of those trained from an administrative stand point, was designated as chief malariologist, and proceeded to organize a program of control, based on knowledge gained from the Rockefeller Foundation experts.

Due to limited funds it was necessary to confine control measures to a limited areas, but it is estimated that by 1940 approximately one and a half million, of the population of the country was receiving protection by antilarval measures, and limited drainage.

This organization carried on, and expanded each year, until the outbreak of war, brought the work to a virtual stand still, and it was in 1942 that Greece had one of its worst epedemics of malaria in years. While there are no accurate records it is estimated that there was a minimum of three million cases that year. From areas where checks could be made there was a very appreciable drop in the number of cases in 1943 - 1944.

At this point it would be interesting to note that a very interesting book on malaria in the country was compiled by the Greek Director of the malaria service, and one of his principal assistents in colaboration with other members of the service, which embodied the work of the various members of the Rockefeller Foundation and such work as had been done by their Greek colaborators. This book very clearly demonstrates the prevelence of malaria in the country, and describes the measures taken to combat the disease, from early days, up to the time the book waspublished.

In October 1944 the writer arrived in Greece with the occupation forces full of enthusiasm and determination to introduce the new method of Malaria control which had proven so successful in the army, and could be introduced with the financial aid of U.N.R.R.A. at such time as D.D.T. could be made available in sufficient quantity.

The first step was to bring together the badly scattered and disrupted organization of the Malaria service, explain to them the use of the new drug and prepare for expanding the force to a point that it would be possible to inaugurate a country wide control program.

As was natural such equipment in the way of sprayers, transportation, clothing, shoes and boots were either non existant or almost worthless due to their worn out condition. Emergency orders were placed in the U.S. for the various equipment required, after estimates of requirement had been made including spray material.

Preparing estimates and submitting them was only the start of our troubles, for every one knows what a fight it was to obtain equipment and material which we required as long as the Pacific war was going on, and no one could find fault with that, knowing the conditions under which American soldiers were fighting, and it was for a time a toss up whether we would loose the fight, not through the efforts of the Japanese but through the effects of Malaria.

By having the full support of the Chief of the U.N.R.R.A. Mission, sufficient pressure was brought on the Washington office to have our requirements approved, and in the meantime through personnel contact with certain members of the Army Medical Corps, it was possible to get sufficient D.D.T. 10% powder to take care of the delousing problem, which was a serious one in the country. It was not until the latter part of 1945 that we were able to obtain sufficient pure D.D.T. to prepare a mix to demonstrate its value as a larvicide, and as a residual spray in houses and out buildings. Due to the limited quantity available, instructions were issued to do the work on a spot basis, for propaganda purposes, in various parts of the country, and this paid off in a big way as the results were so fantastic, that there was an appeal from all parts to do the spraying, so when our full quota of supplies arrived during the Winter of 1945 and 1946 we were met with open arms for the 1946 campaign.

We were fortunate in having a number of U.S.P.H.S. Sanitary Engineers, and Sanitarians scattered through out the country, the larger number of which were familular with the use of D.D.T. from their army service, and also the services of the malariologists, and inspectors of the Government service, that had been trained by the Rockefeller Foundation in the application of the old methods of control, who showed a keen interest in the new method being employed, and were thoroughly familular with the country, and the importance of the different Malaria vectors.

It was this set up that made it possible to get organized in 1945, and use every thing we had at that time available, and be prepared to do an out standing control program in 1946, but even in 1946 the organization could not be built to proportions that made it possible to reach all parts of the country, and it was at this point that the airplanes played a most important and deciding factor from a control stand point, as it was possible to reach all swamps in Greece by plane, as well as a large number of dangerous river beds, and it was the spraying of these breading spots that gave such uniform

results from a control stand point for the entire country. In 1947 it was possible to still further extend the residual spray work of houses and out buildings as material was made available in large quantity and distributed to the more remote areas.

From clinical reports, and such limited data as it was possible for the small number of Malariologists to obtain, from actual examination of school children, babies, and others the drop of Malaria in the country surprised the most optimistic. In most areas it was brought just about the vanishing point.

It is interesting to examine the reports of labor turn over on agricultural work, which were checked in various parts of the country, and a very concrete example is that obtained from the thousands of acres that are being cultivated by the Sake Kopies Co. This company over the many years they have been operating counted on a minimum of 30% turn over of labor in non epedemic years, and ran as high as100% in epedemic years. This turn over dropped to just about zero in 1946 and held more or less the same in 1947. Another large holding is that at Kato Soule, which had always been notorious for its malaria. The population surrounding this area, was to all intents and purposes 100% malarious. In 1946 and 1947 malaria just about disappeared, and the owner stated that for the first time the area was placed on a money making basis. Many other concrete examples could be mentioned of similar character.

It is safe to state that there was a minimum of thirty million man days saved Greece in 1946, and a like number in 1947. What this saving has meant to the country from an economic stand point runs into large figures, and its effect is felt in every branch of Public Health. It is a well known fact that malaria is the fore runner of many other diseases, that its general dehabilitating effect, make the individual susceptable.

In describing the effect of the use of D.D.T. from a malaria control stand point, one should not loose sight of the fact, that this wonderful drug gives much further than simply the control of malaria, as it destroys many other obnoxious, if not dangerous insects, that attack man kind, such as bed bugs, fleas, lice, sand flies, roaches, ants, and a degree flies.

We at one time thought that it was the final answer to common house fly control, but work in 1947 and 1948 shows that while flies are destroyed, where spraying is done many survive, and we realize all the more thoroughly that to handle the fly problem D.D.T. must be assisted by general sanitation. We believe that a combination of the two if applied thoroughly will reduce the fly nuisance to a minimum.

This brief general outline of the malaria program carried out so successfully in Greece to date, should not be closed without a word of warning to the Government and the people of Greece, it should be thoroughly

understood by one and all that malaria has not been banished from the country, and only by following up the gains so far made can the country be prevented from drifting back to the state existing for centuries. The chain has not been broken, as there are old well routed cases that will have relapses for years, that are dangerous carriers of the dreaded disease, and in addition Greece's neighbors have not attached the problem facing them, and carriers will be crossing the borders from time to time, not to mention the fact that mosquitoes recognize no borders anddo not hesitate to migrate when they see fit.

Greece has the foundation for an effective malaria control program, and a school that if properly run is capable of training malaria digests Sanitary Engineers, technicians, inspectors and foremen, that would be as capable of handling the problem of control as well as any men that could be brought into the country and better.

The present Director of the malaria control service and all of his assistants owe their knowledge of malaria control directly or indirectly to the Rockefeller Foundation. The malariologists were trained under the direct supervision of Foundation experts in the fundamentals of malaria research, and in addition these men were provided with fellowships in the U.S. for from one to two years, to give them the advantage of observing and working with men employed on similar work there. Not one of the men connected with the service had the remotest idea of making a malaria survey or the application of control measures prior to the Foundation's coming to Greece, but fortunately with few exceptions the men chosen for this work were enthusiastic and anxious to learn, and have devoted their time and energy to the work under most trying circumstances, such as poor pay, lack of transportation, little if any chance of promotion or for that matter a futur worth working for. Butmuch members of the old trained force from the Director of the service down to the men doing spray work, showed a keen interest in the new method of control when it was explained to them, and while many were skeptical at first, of the claims made for this new drug, it did not take long to prove its value far in excess of that claimed, and to one not familular with what was done and how, might think from reading published articles, by certain of the malaria force, that D.D.T. had been introduced and proven of value, by the malaria force existing in the country at the time it was introduced by U.N.R.R.A.

This is not surprising for it is a well known fact that people have short memories, and can be easly misled.

U.N.R.R.A. has come and gone, A.M.A.G. has come and gone or is going soon, E.A.C. is taking over, on what promices to be a four year program, and now is the time for the Greek Government to present a carefuly prepared statement showing in detail, just what the control of Malaria has meant and will mean to the economic life of the country, and why it is necessary to continue the fight to take advantage of the gains made to date. If control measures were to stop now,b before the chain is definately broken, it would be but a very few years until the country would drift back

to its original state, and malaria would soon gain its original place as no 1 killer in the country.

There is no reason what ever but what the cost of this work should be born by the people directly benefiting from the control measures necessary. The residual spraying should be done by labor furnished by the villages, and the actual cost of the material used should be a direct charge to the villages. If this plans were worked out and executed, the Government, would only be required to cover the cost of supervision and the spraying of swamp areas, garbage dumps, water fronts and such parts of cities as it may be considered necessary from time to time to spray from the air, for fly or other insect control. In other words the malaria and general insect control can and will become self supporting in the different regions.

United States Aids Greece
in Fight against Malaria.

ATHENS.
Nov. 16, 1948

Since the beginning ofnAmerican aid, more than $700.000 has been spent by the American Mission to enable the Greek Government to continue the find work it is accomplishing in the control of malaria, according to Dr. O.F. Hedley, Director of the Public Health Div. American personnel also have assisted the Greek Government and other agencies in the eradication of this scourge which, for years, impeded Greek economy and resulted in much illness among the Greek people.

Not only did the American Mission contribute financially, but members of its staff furnished technical assistance in many ways. Harvie E. Lowry of Richmond, Virginia, Aircraft Maintenance Specialist, directed the maintenance of the planes and gave valuable assistance in developing the airfield at Megara, the training program for pilots, and in scheduling operations. Senior Sanitary Engineer Richard S. Mark, of Lebanon Pennsylvania, Sanitary Engineer Gerald W. Ferguson of Summerville, N.Jersey, and Engineer James L. Curch, of Knoxville, Tenessee, U.S. Public Health Service officers assigned to the Public Health Division -also furnished technical advise in many phases of the malaria control program, which consists not only of airspray operations, but resulted in the house-spraying with DDT of more than 4,700 communities and larvicidal hand-spraying of many swamps not accessible to airspray operations.

Dr. Hedley of Richmond, Va., a Medical Director in the U.S.P.H.S., stressed that the malaria control program has been a joint operation in which many organizations have participated. These include UNRRA, Greek War Relief, WHO, the School of Hygiene, the Malaria Control Service of the Ministry of Hygiene, the Rockefeller Foundation and various branches of the Mission. "There was work enough for all of us", he commented.

"Special credit belongs to that veteran campaigner against malaria, Colonel Dan E. Wright, who has recently returned to the U.S.", Dr. Hedley emphasized. "Colonel Wright was responsible for many of the modern concepts of malaria control and has been a leader in their execution. Greece owes him a debt of gratitude.

RS - LS
REGENERATION
Planting
(Pelleted Seed)

June 14, 1949

PELLETED SEED FOR REFORESTATION

By Paul O. Rudolf
Lake States Forest Experiment Station 1/

Reforestation by means of pelleted seed sown directly in the field has attracted much interest recently. In 1947 the Station participated in a small test which showed no advantage for pelleting. However, several new pellet materials and techniques have been developed recently, so that further exploratory tests are desirable.

As a basis for planning new tests of pelleted seed, all agencies known to have conducted such work have been contacted. The information obtained from them is summarized here.

PURPOSES OF PELLETING

Pelleting seed is not a new idea. It has been tried intermittently on a small scale at least since the time of the First World War. However, large scale use and commercial pelleting did not arise until the Second World War. It was tried then by the sugarbeet industry in connection with the development of drill seeders capable of very accurate sowing.

There are two main purposes of pelleting seed: One is to provide more economical use of seed through better control of distribution in sowing, and the other is to provide favorable conditions for seed germination on the soil surface. For reforestation the greatest advantage probably would be the possibility of establishing seed spots without the development of multiple seedlings. If at the same time pellets could be developed which provided protection of the seed and seedling from damage by rodents, birds, disease organisms and other enemies while fostering good germination, this would be so much added advantage.

METHODS OF PELLETING

A variety of materials has been tried for making pellets. Ideally a pellet material should be easy to handle in rapid processing, should not be injurious to the seed either before or after germination, should be sufficiently firm to permit reasonable handling in seeding machinery (and in some cases airplane seeding), yet should disintegrate under favorable moisture conditions rapidly enough to avoid hindrance to seed germination, and it should be reasonable in price. Aside from these characteristics, a pelleting material should also permit the addition of nutrients, repellents, insecticides, fungicides, or hormones.

1/ Maintained by the U. S. Department of Agriculture, Forest Service, in cooperation with the University of Minnesota, University Farm, St. Paul, Minnesota.

The most common pelleting materials are clays of various kinds. Aside from local clays, these include modelling clay, ball clay, kaolin, and montmorillonite (a soft clay-like mineral of hydrous aluminum silicate). In addition, the following materials also have been used alone or in various mixtures with or without clays; ground rattle bush bean, plaster of Paris, tung nut pomace, dextrin, powdered foamglass, dithiobiuret, anthraquinone, feldspar, fly ash, and diatomaceous earth. To these materials there have usually been added various rodent repellents and frequently also fertilizers, fungicides, insecticides, or growth hormones.

Pelleting Processes

Many pellets for small scale tests have been made by hand. However, this is too expensive for large scale work, so several commercial processes have been developed. These are of two general types; accretion processes in which the pellets are built up by adding successive layers of material, and pressure processes in which the seeds and pelleting material are forced through openings. Three companies are now known to produce commercial pelleted seed. They are: The Filtrol Corporation of Los Angeles, California; the International Seed Pelleting Company of Phoenix, Arizona; and Processed Seeds, Inc., of Midland, Michigan. Earth pellets

Apparently the first in the field was Processed Seeds, Inc., which has operated under different names (Chemi-Coat Seed Company, American Seed Processing Company) since its inception during World War II. The seeds are coated in a machine which superficially resembles a cement mixer. As the spherical shaped pan rotates at about 45° from the vertical the seeds are tumbled over one another. The seeds are moistened with an adhesive (methyl cellulose) and then powdered material is added (feldspar and fly ash) which adheres to the adhesive covered seed. After the coat has dried, successive coats are added until the pellet is the desired size. Fertilizers, repellents, and other materials can be added and pH can be controlled as desired. Pellets of Douglas-fir and presumably most other conifers are elliptical in shape. Recent quotations for pelleting in large batches (seed furnished by customer) range from $.14 per pound for seeds like white pine to $.20 for those like spruces and firs.

The International Seed Pellet Company uses a process developed by Dr. L. S. Adams, its founder. Seeds are mixed with adobe clay which is placed in a machine consisting of four gear-like wheels which mesh in such a manner that a moist seed-filled clay mix is pressed from four sides into spherical balls at rates reported up to 48,000 per hour. These pellets were designed especially for aerial seeding of grasses.

The Filtrol Corporation develops their "Filcoat" pellet from a highly colloidal aluminum silicate (montmorillonite). Seeds are placed in a drum and moistened by a spray of water. Then the coating material is added and the seeds are tumbled about. The addition of moisture and coating material is continued until the pellets are of proper size (Douglas-fir pellets are 1/4 inch in longest diameter). The pellets are screened to get uniform size and then are dried by forcing a large volume of air across them. If the humidity is high, the air is heated to about 10 degrees F. above atmospheric temperature. Repellents, fertilizers, and such materials can be added and pH controlled as desired. The cost of pelleting Douglas-fir seed has just about equaled the cost of the seed.

Related Processes

Several other methods of coating seeds were tried at the Pacific Northwest Forest and Range Experiment Station. These were pressure-formed tablets (calcium carbonate), gelatin capsules, hand-rolled pills (powdered sugar), machine-rolled pills (powdered sugar), and triturate tablets (powdered sugar). For one reason or another all proved unsatisfactory. The Crown Zellerbach Company is trying capsules containing Flowerite and vermiculite with seeds, fertilizers, growth hormones, and fungicides.

A graduate student (Joe Clark) at the University of Washington has developed a tablet which, along with 2 seeds, includes leaf mold, Douglas-fir bark, peat moss, and redwood bark reduced to definite sizes. Apparently somewhat similar were the briquets developed by Dr. S. A. Wilde at the University of Wisconsin several years ago. These were compressed peat, seed, and nutrients.

Good and Bad Features of Various Pellets

For either aerial or ground seeding the added weight of pellets carries the seed through brush, leaves, and grass and gives it a better opportunity to reach the soil and take root. Pelleting permits better control of smaller seeds. A general disadvantage is the added bulk and weight of pelleted seed. This varies considerably. Jack pine seed in pellets of one type weighed 9 times the amount of bare seed. Douglas-fir seed increased in weight about 20 times when pelleted by another process; and certain grass seeds pelleted by a third process weighed 920 times as much as when bare.

Certain kinds of pellets have disadvantages for certain purposes. The Processed Seeds Company type has not been hard enough for use in the walking-stick planter developed in the Pacific Northwest. The International Seed Pelleting Company type may be sufficiently irregular in shape to cause excessive wear on some aerial seeding equipment and the pressure used in the process may injure the seed. Tests at the Intermountain Station have showed injury to 42 percent of the seed in pellets of this type.

SPECIES TESTED AND RESULTS

According to information available, the seeds of over 20 range plants and about 18 forest tree species have been tested in pelleted form (Table 1). The range species, chiefly grasses and legumes, include the following: purple alfalfa, smilograss, big bluegrass, canby bluegrass, mountain brome, smooth brome, soft brome, California bur-clover, tomcat clover, sweet clover, sand dropseed, Ehrharta calycina, foxtail (arundinaceous), Harding grass, Lehmann lovegrass, sand lovegrass, weeping lovegrass, Wilman lovegrass, California needlegrass, hyaline needlegrass, common ryegrass, Wimmera ryegrass, timothy, crested wheatgrass, and western wheatgrass. The tree species tested are Douglas-fir; balsam, noble, and Pacific silver firs; western hemlock; jack, loblolly, longleaf, ponderosa red, slash, eastern white, and western white pines; Port-Orford cedar; and black, Norway, Sitka, and white spruces.

Range seeding of pelleted seed has been quite extensive. Over 90,000 acres has been sown aerially on Indian reservations in Arizona alone, and the Southwestern Region of the Forest Service has contracted for similar sowing of 6,400 acres this spring (1949). Altogether, aerial seeding, broadcast

seeding, and drill seeding have been tried on several types of land and soil conditions. So far, results usually have been poor, and only fair at the best. Pelleted seeds have done no better than bare seeds, and in some cases have done worse. To be equal economically, grass seed would have to increase in cost at least three times (for some species), or the present cost of pelleting would have to drop to about 1/4 of what it is, was the conclusion reached from one set of studies.

The results with sowing pelleted tree seeds have been predominantly poor, occasionally fair, and rarely good. In one case only have pelleted seeds given results better than those with bare seeds. Usually they were about the same, but in several instances they were worse. Seeding has been done in many localities, on prepared and unprepared ground, broadcast (by hand or from airplanes) or in seedspots; in the laboratory, nursery, or field -- none of the methods tried can yet be called successful. The most extensive tests have been made in Ontario where several hundred acres have been sown with pelleted seed, both by airplane and ground methods.

A major stumbling block, both with range and forest species, has been the inability to find a uniformly successful rodent repellent which could be incorporated in the pellets. Several agencies are searching for such repellents and success may attend their efforts at any time.

RECOMMENDATIONS FOR FURTHER STUDIES

Since no highly promising leads have developed from research to date, the time does not seem ripe for large-scale studies with pelleted seed. However, further exploratory studies do seem desirable to test additional species, to sample more conditions, and to try new kinds of pellets or additional repellents and other additives as they become available. In all tests it would be desirable to protect part of the spots from birds and rodents and to sow bare seeds of the same lots as controls.

Table 1.- Results of pelleted seed tests. [2]

Species	Pelleting materials	Source of Pellets 1/	Methods of sowing	Results	Compared with controls	Agency making test
			Range Plants			
Grasses and legumes 2/	Montmorillonite, and montmorillonite plus inert filler	1	Broadcast sown on various types of land	Poor to fair	No better	S.C.S.
Grasses and legumes 3/	Clay and fertilizers plus rodent repellent	2	Aerial seeding	Poor to fair	No better	U.S.I.S.
Grasses (mainly crested wheat grass)	Clay	2	In laboratory and field	Poor	Worse	Int.F. and R.E.S.
Lehmann, sand, and Wilman lovegrasses	Clay	2	In field	Poor	No better	S.W.F. and R.E.S.
Range plants	Clay	2	Broadcast and drilled in field	Poor	No better	Bur. Land Mgt.
			Forest Trees			
Douglas-fir	Montmorillonite; feldspar and fly ash	1, 3	In field plots	Poor	No better	P.N.W.F. & R.E.S.
	Raw clay plus repellents	4	Outdoor flats and field plots	Fair to good	No better	F.W.S.
Balsam fir	Feldspar and fly ash	3	In field plots	Poor	Worse	Cons. W. & P. Co.
Noble fir	Montmorillonite; feldspar and fly ash	1, 3	In field plots	Poor	No better	P.N.W.F. & R.E.S.
	Raw clay plus repellents	4	Outdoor flats and field plots	None	No better	F.W.S.
Pacific silver fir	Raw clay plus repellents	4	Outdoor flats and field plots	None	No better	F.W.S.
Western hemlock	Montmorillonite	1	Seed spots in field	Poor to fair	No better	Crown-Zellerbach
	Montmorillonite; feldspar and fly ash	1, 3	In field plots	Poor	No better	P.N.W.F. & R.E.S.
	Raw clay plus repellents	4	Outdoor flats and field plots	Poor to fair	Worse	F.W.S.

Species	Pelleting materials	Source of 1/ Pellets	Methods of sowing	Results	Compared with controls	Agency making test
Jack pine	Clay and other materials 4/	4	In laboratory flats	Poor	Worse	F.W.S.
Loblolly pine	Clay and fertilizers, fungicide and repellent	4	In field and green house	Fair	No better	Champion Fiber
	Montmorillonite; feldspar and fly ash	1, 3	Sown in nursery	Poor	Worse	Miss. F.S.
Longleaf pine	Montmorillonite; feldspar and fly ash	1, 3	Sown in nursery	Poor	Worse	Miss. F.S.
	Clay and fertilizer; fungicide and repellent	4	In field and green house	Fair	No better	Champion Fiber
Ponderosa pine	Not reported	-	In field--screened and unprotected	Fair	No better	F.W.S.
Red pine	Feldspar and fly ash	3	Sown in nursery	Poor	Worse	M.S.C.
	Diatomaceous earth and fly ash	4	In field	Poor	Worse	Ont. Dept. of Forest & Lands
Slash pine	Feldspar and fly ash	3	In field on prepared or unprepared ground	Poor	Worse	Fla. F.S.
	Montmorillonite; feldspar and fly ash	1, 3	Sown in nursery	Poor	Worse	Miss. F.S.
Eastern white pine	Feldspar and fly ash	3	Sown in nursery	Poor	Worse	M.S.C.
	Diatomaceous earth and fly ash	4	In field	Poor	Worse	Ont. Dept. of Forest & Lands
Western white pine	Local clay	4	In field	Fair	No better	Kaniksu N.F.
Port-Orford cedar	Montmorillonite	1	Seed spots in field	Poor to fair	No better	Crown-Zellerbach
Black spruce	Feldspar and fly ash	3	In field plots	Good	Better	Cons. W. & P. Co.
Norway spruce	Feldspar and fly ash	3	Sown in nursery	Poor	Worse	M.S.C.
Sitka spruce	Montmorillonite	1	Seed spots in field	Poor to fair	No better	Crown-Zellerbach
	Montmorillonite; feldspar and fly ash	1, 3	In field	Poor	No better	P.N.W.F. & R.E.S.
White spruce	Feldspar and fly ash	3	Sown in nursery	Poor	Worse	M.S.C.

Species	Pelleting materials	Source of 1/ Pellets	Methods of sowing	Results	Compared with controls	Agency making tests
White spruce	Feldspar and fly ash	3	In field plots	Poor	Worse	Cons. W. & P. Co.
	Diatomaceous earth and fly ash	4	In field	Poor	Worse	Ont. Dept. of Lands & Forests

* Please do not quote any results without clearance from agency making the tests.

1/ 1 = Filtrol Corporation, 2 = International Seed Pelleting Company, 3 = Processed Seeds, Inc., 4 = locally made.

2/ Included Alopecurus arundinaceus, Bromus mollis, B. carinatus, Ehrharta calycina, Eragrostis lehmanniana, Lolium multiflorum, L. subulatum, Medicago hispida, M. sativa, Oryzopsis miliacea, Phalaris tuberosa stenoptera, Poa ampla, P. canbyi, Stipa hyalina, S. pulchra, Trifolium tridentatum.

3/ Eragrostis lehmanniana, E. curvula, Sporobulus cryptandrus, Agropyron Smithii, A. cristatum, Bromus inermis, Melilotus sp., and Phleum pratense.

4/ Ground rattle bush bean, plaster of Paris, tung nut pomace, kaolin, dextrin, modelling clay, ball clay, powdered foamglass, dithiobiuret, anthraquinone, and compound No. 11-317 used in combinations.

APPENDIX A 1/

Experiments with Range Plants

1. Agency - Soil Conservation Service, Southern California Nursery Unit, San Fernando, California.

2. Species tested - Grasses and legumes: Alopecurus arundinaceus, Bromus mollis, B. carinatus, Ehrharta calycina, Eragrostis lehmanniana, Lolium multiflorum, L. subulatum, Medicago hispida, M. sativa, Oryzopsis miliacea, Phalaris tuberosa stenoptera, Poa ampla, P. canbyi, Stipa hyalina, S. pulchria, Trifolium tridentatum.

3. Pelleting materials - Done by Filtrol Company. Used two types: 100 percent montmorillonite (the special clay used) and another with an inert filler added to the montmorillonite.

4. Techniques used - Broadcast seeding on various types of land.

5. Results - Long brittle seeds injured in pelleting.

   a. Poor results on difficult sites in drought year with all kinds.

   b. On Class III land no advantage over untreated seed.

   c. On better range lands, germination fairly good — results not yet final for comparison.

6. Recommendations

   a. Pellets of cheto plus inert filler can be extruded with less pressure and hence with less injury to seed.

   b. Use more than one seed per pellet — usually happens in extrusion.

   c. Die hole for pellet should have diameter greater than long axis of seed.

   d. Pellet material should take up water readily but be sufficiently cohesive to make disintegration a slow process.

   e. Include rodent repellent with meaty seed, such as most tree seeds.

   f. Possibly use fertilizer and fungicide in pellet also.

7. Reporter - Lowell A. Mullen, Agronomist.

8. Date - January 27, 1949

1/ Please do not quote any results without clearance from agency making the test.

1. Agency - Papago Agency, U. S. Department of Interior, Sells, Arizona.

2. Species tested - Lehmann's lovegrass (Eragrostis lehmanniana) and sand dropseed (Sporobolus cryptandrus); have small seeds (3 million to 7 million per pound) which are easily destroyed by insects and rodents.

3. Pelleting materials - Clay with small amounts of fertilizer and rodent repellent. Pellets were size of garden pea and contained 6-10 seeds. Done by International Seed Pellet Company (Dr. Adams).

4. Techniques used - Seeded from airplane before summer rains in 1946. Seeded over 10,000 acres at altitude of 2,800 to 3,100 feet above sea level. Sowing rate about 1 pellet per square foot of area, or 261,000-436,000 seeds per acre. Soils varied from good to poor -- mostly medium to coarse texture and slowly permeable to permeable, and slopes of 2-8 percent. Some erosion. Chiefly mesquite vegetation.

5. Results - Got about 1,900 plants per acre end of first year, 75 per acre end of second year. Pellets disintegrated after first rain. Many shattered on contact. None penetrated into soil.

6. Recommendations - Prepare ground in advance of seeding. Sow equal areas with untreated seed and with pelleted seed. Don't hold seed long, either in pellets or otherwise, since there is apt to be some deterioration.

7. Reporter - Burton A. Ladd, Superintendent.

8. Date - February 7, 1949.

1. Agency - Office of Indian Affairs, Phoenix, Arizona.

2. Species tested - Lehman lovegrass, sand dropseed, weeping lovegrass, western wheatgrass, crested wheat grass, smooth brome grass, sweet clover, and timothy.

3. Pelleting materials - Materials having 25-27 percent clay fraction because of its favorable colloidal content and cohesiveness for cementing and binding qualities. Sought soils with paucity of quartz grains to avoid wear on pelleting machinery. Organic matter content, fertilizer constituents, and general location near machinery and landing strips also considered. Pellets made by International Seed Pellet Company.

4. Technique used - Aerial sowing.

5. Results - 90,000 acres seeded from April 1946 to August 1948. Results not all available (but generally not too favorable).

6. Recommendations

7. Reporter - W. H. Berry, Regional Soil Conservationist.

8. Date - January 18, 1949.

1. Agency - Intermountain Forest & Range Experiment Station, Ogden, Utah.

2. Species tested - Checked results of Bureau of Land Management tests with grasses, particularly crested wheat grass.

3. Pelleting materials - Pellets averaged .55 grams in weight, 7.6 pH, 1.08 percent salinity, and contained 3-5 seeds (making up 1.09 percent of the pellet weight), of which 42 percent were damaged.

4. Technique used - not reported.

5. Results of tests - Laboratory germination.

	In sand flats[1]	In petri dishes
	Percent	Percent
Whole pellets	4.09	5.67
Whole pellets [2]	6.82	-
Crushed pellets	12.95	-
Undamaged seed from pellets	-	19.52
Damaged seed from pellets	-	2.35
Naked, unpelletized seed	53.75	51.50

1/ Sown 3/8 inch deep.
2/ Sown on surface.

Observations on ground also indicate that pelleting is a detriment and not an advantage in seeding.

6. Recommendations - Await further results.

7. Reporter - Reed W. Bailey, Director

8. Date - January 26, 1949.

1. Agency - Southwestern Forest & Range Experiment Station, Tucson, Arizona.

2. Species tested - Lehman lovegrass, sand lovegrass, Wilman lovegrass.

3. Pelleting materials - Dr. Adams (International Seed Pellet Co.,) method (Clay).

4. Techniques used - Used 8 seed per pellet.

5. Results of tests - Lehman lovegrass pellets germinated 64 percent (but only 1.2 seeds per pellet); sand lovegrass, 15 percent; Wilman lovegrass, 28 percent. Weight makes practice uneconomical, requires a weight lift of 920 pounds as compared to one pound of naked seed. Pelleted seed has yet to establish a satisfactory stand of grass where naked seed has failed in small range plot tests of Lehman, Wilman, and sand lovegrass.

6. Recommendations - Pelleting offers an opportunity for a saving in seed but at the present cost of seed and pelleting, Lehman's lovegrass seed would have to triple in price, or the cost of pelleting would have to decrease to 1/4 of what it is now for economic advantage.

7. Reporter - Raymond Price, Director.

8. Date - November 24, 1948.

1. Agency - Rocky Mountain Forest & Range Experiment Station, Fort Collins.

2. Species tested - Range species.

3. Pelleting materials - Clay, pelleting done by Adams Company (International Seed Pellet Company of Phoenix, Arizona).

4. Techniques used - Broadcast and drilled pelleted and naked seeds on prepared and unprepared seedbeds.

5. Results - Results of Station tests not yet available. Tests by Bureau of Land Management in Wyoming and Idaho, end of first year, showed that pelleted seed gave poorer results than naked seed sown broadcast, and neither gave good stands without seedbed preparation and seed covering, on range lands.

6. Recommendations

7. Reporter - W. G. McGinnies, Director.

8. Date - November 17, 1948.

1. Agency - School of Forestry, University of Idaho.

2. Species tested - Crested wheatgrass and other range species.

3. Pelleting materials - Compression type of pellet from International Seed Pellet Company, and accretion type pellet of Processed Seeds, Inc.

4. Technique used - Sowed seeds both in laboratory and field.

5. Results - Not yet complete. However, accretive type pellets have shown up better in both laboratory and field. Compression type produces considerable mechanical damage to seed and also inhibits germination.

6. Recommendations - Further tests needed.

7. Reporter - E. W. Tisdale, Associate Professor, Range Management.

8. Date - January 18, 1949.

APPENDIX B 1/

Experiments with Forest Tree Species

1. Agency - Dunbar Forest Experiment Station, Michigan State College.
2. Species - Red pine, white pine, white spruce, Norway spruce.
3. Pelleting materials - Done by Processed Seeds, Inc.
4. Techniques used - Sown in nursery seedbed using randomized blocks. Sowing later than desirable.
5. Results - Damping off affected all. In all cases controls were better than treated -- differences statistically significant.
6. Recommendations - Make more comprehensive tests.
7. Reporter - Maurice W. Day.
8. Date - February 11, 1949.

1. Agency - Florida Forest Service.
2. Species tested - Slash pine.
3. Pelleting material - Done by Processed Seeds, Inc.
4. Techniques used - Sowed in three localities over the state in prepared and unprepared soil.
5. Results - Sown late (last of April). No rain for first month and coating disintegrated without seeds sprouting.
6. Recommendations - Further tests planned for this winter; no recommendations until further results available.
7. Reporter - R. A. Bonninghausen, Acting State Forester.
8. Date - January 11, 1949

1/ See footnote on page 1, Appendix A.

1. Agency - Extension Forester, Massachusetts.

2. Species tested - Red pine, Norway spruce.

3. Pelleting materials - Done by Processed Seeds, Inc. (Vogelsang).

4. Techniques used - Planted seed with corn planter.

5. Results - Not yet available.

6. Recommendations - Will try cork oak acorns covered with fiber glass tape next spring.

7. Reporter - Robert B. Parmenter.

8. Date - January 26, 1949.

1. Agency - Champion Paper and Fiber Company, South Carolina State Commission of Forestry, Clemson College, and Camp Manufacturing Company in cooperation.

2. Species tested - Loblolly pine, longleaf pine.

3. Pelleting materials - Clay, superphosphate and potash fertilizer, an adhesive fungicide, and a rodent repellent. Done in machine made for sugar coating pills, manufactured by Arthur Colton Company, 2600 E. Jefferson Ave., Detroit, Michigan (their catalog 11, Section A). Considered economical process.

4. Techniques used - Planted pelleted and unpelleted seeds on 2-3 acre experimental plots from the Upper Piedmont of South Carolina to the coastal plains of South Carolina and Virginia.

5. Results - Mechanics of making pellets economically are well worked out. Field results not yet available. Greenhouse tests with hormones included in pellets gave no particular advantage.

6. Recommendations - More research on pellet ingredients now a hit or miss selection.

7. Reporter - T. H. Davis, Research Forester, Champion Fiber Company, through J. W. Cruikshank, Southeastern Forest Experiment Station.

8. Date - November 24, 1948.

1. Agency - State Forester, Mississippi.

2. Species tested - Pines.

3. Pelleting materials - Pellets made by Filtrol Corporation and Processed Seeds, Inc.

4. Techniques used - Sowed in nursery (Mount Olive).

5. Results - Details not available. In general, results are inferior to those with untreated seeds (check sowings).

6. Recommendations - Further study needed.

7. Reporter - Albert Leggett, State Forester, through P. R. Wheeler, Southern Forest Experiment Station.

8. Date - November 24, 1948.

1. Agency - Kaniksu National Forest.

2. Species tested - Western white pine.

3. Pelleting materials - Clay mud of local origin. No additives.

4. Techniques used - Pelleted by hand. Seeded in comparison with untreated seed.

5. Results - Pelleted seed had no superiority over unpelleted seed.

6. Recommendations

7. Reporter - Donald Lynch, through M. B. Dickerman, Northern Rocky Mountain Forest and Range Experiment Station.

8. Date - November 18, 1948.

1. Agency - Crown Zellerbach Corporation, Portland, Oregon.

2. Species tested - Western hemlock, Port-orford cedar, and Sitka spruce.

3. Pelleting materials - Done by Filtrol Corporation. Coating, including fertilizers, rodent repellents, and growth promoting materials is applied to each individual seed by a continuous non-pressure process. Pellet weighs some twenty times that of bare seed.

4. Techniques used

   a. Seed spots, made with calked shoe or 5-pronged converted garden scratcher, using 4-15 seeds per spot.

   b. Flowerite and Vermiculite (sterile carrier materials which absorb many times their own weight of water and trap and hold air) are being used in capsules with seeds, fertilizers, growth hormones, and fungicides. Results not yet available. Also a tablet has been developed by Joe Clark (graduate student of University of Washington) which includes leaf mold, Douglas-fir bark, peat moss, and Redwood bark reduced to definite sizes, each tablet has two seeds, is treated with fungicide, moistened thoroughly, and then stratified. Results so far inconclusive.

5. Results - Some trees on all areas. Comparison not direct, but most trees were found on area poisoned against rodents, using unpelleted seeds. Greenhouse tests underway are not yet complete. The added weight carries the seed through brush, leaves and grass, giving it a better opportunity to reach the ground and take root. Pelleting allows better control of the smaller seeds, resulting in lower cost per acre for seed as well as lower labor costs, since the pellets are far easier to work with than tiny seeds.

6. Recommendations - Try more tests.

7. Reporter - G. H. Schroeder, Forestry Staff.

8. Date - January 25, 1949.

1. Agency - Fish & Wildlife Service and Lake States Forest Experiment Station, in cooperation.

2. Species tested - Jack pine.

3. Pelleting materials - Pellets:

R-203 Daubentonia drummondii (rattle bush bean) finely ground.
R-204 Daubentonia drummondii (rattle bush bean) finely ground with addition of plaster of Paris.
R-205 Tung nut pomace, plaster of Paris, and dextrin.
R-206 Kaolin in plaster of Paris.
R-207 Ball clay and plaster of Paris.
R-208 Modelling clay and plaster of Paris.
R-209 Ball clay and ground tung nut pomace.
R-210 Ball clay and ground Daubentonia drummondii.
R-211 Ball clay and dextrin.
R-212 Ball clay and powdered foamglass.
R-213 Ball clay and dithiobiuret.
R-214 Ball clay and anthraquinone.
R-215 Ball clay and compound No. 11-317.

4. Techniques used - Pellets made by hand (7-10 seed per pellet). Tested in germination room at Lake States Station in sand flats at temperature of 68° F. (night) to 86° F. (day).

5. Results - Germination was not particularly high, ranging from .1 to 2.4 seeds per pellet in 30 days, except that materials R-203, R-209, and R-213 gave no germination. In all but one case (R-208) from 25-75 percent of the remaining ungerminated seeds were spoiled. The condition of the pellets at the conclusion of the germination tests was as follows:

R-205 Pellets tended to break up, although in some cases the pellets were pushed up out of the sand by groups of three or four seedlings. They were somewhat expanded due to soaking with water.
R-206 Quite soft. Pellets not lifted out of sand by germinating seedlings.
R-208 Fairly solid.
R-215 Fairly solid.
R-214 Fairly soft.
R-207 Fairly solid.
R-212 Quite solid. Pellets sometimes pushed up by seedlings.
R-211 Quite solid, in several cases almost hard.
R-204 Expanded to twice original size. Fairly soft. Still holding shape.
R-210 Quite solid. Slightly enlarged. In one case four seedlings had germinated inside but were not able to push out.
R-204 Expanded to twice original size. Mold accumulation on top. Seemed to hold shape.
R-213 Quite solid.
R-209 Fairly solid pellet, sticky when opened.

6. Recommendations - Unpelleted seed gave better laboratory results, so recommendations were to omit pellets in field test.

7. Reporter - R. H. Gensch, Biologist.

8. Date - July 23, 1947.

1. Agency - Research Division, Ontario Department of Lands & Forests.

2. Species tested - White pine, red pine, and white spruce.

3. Pelleting materials - Abandoned Dow formula of 65-35 feldspar and fly ash in favor of 50-50 mixture of diatomaceous earth and fly ash. Have added various fungicides, fertilizers, trace elements, and rodent repellents.

4. Techniques used - Seed coated or pelleted in a tumbler coater. Tried storage in refrigeration at alternating temperatures and with or without moisture. Used airplane seeding on burns, sowing 5,000-10,000 seeds per acre with special seeding device.

5. Results - In 1947 on one area got 1 percent germination, on another got 0.5 percent, and 1 seedling per acre survival. Another showed moderate reproduction which may be largely from remaining seed trees.

6. Recommendations - Other tests are underway; recommendations must await further findings.

7. Reporter - A. P. Leslie.

8. Date - June 1948.

1. Agency - Pacific Northwest Forest and Range Experiment Station.

2. Species tested - Douglas-fir, western hemlock, Sitka spruce, and noble fir.

3. Pelleting materials - Processed seeds (feldspar filler and methyl cellulose solution as binding material), International Seed Pellet Co. (adobe clay), and Filtrol Corporation (highly colloidal aluminum silicate). Also tried were pressure-formed tablets of calcium carbonate, gelatin capsules, non-pressure tablets (of powdered cane sugar), hand-rolled sugar pills, machine-rolled sugar pills, and triturate tablets (also of powdered sugar).

4. Techniques used - Standard techniques of pelleting, etc. Seed-spotting in field, with and without walking-stick planter.

5. Results - On Cascade Head Experimental Forest all species germinated about same in pellets (Processed seeds) as without, but because of dry weather all were below 10 percent -- pellet not hard enough for hand planter. Douglas-fir seed in Filcoat pellet germinated as well as controls or better on the surface of sand but germinated very poorly when buried 1/8 inch in sand. Pelleting cost about 20 cents per M seeds, about same as cost of seed alone.

6. Recommendations - Make further tests.

7. Reporter - Roy R. Silen.

8. Date - June 1948.

1. Agency - Fish and Wildlife Service, Portland, Oregon.

2. Species tested - Western hemlock, Douglas-fir, and true firs (A nobilis, and A amabilis).

3. Pelleting materials - Raw clay matrix with some 40 different rodent repellents.

4. Techniques used - Germination tested in outdoor flats and in field plots, and exposed to white-footed mouse damage. Number of seeds per pellet was 10 for hemlock and 3-5 for the true firs and Douglas-fir.

5. Results - For western hemlock laboratory germination was poor to good in pellets and high for bare seed, while in the field it was 0-3 percent in pellets and 8 percent for bare seed; the fir seed did not germinate in the test period; Douglas-fir seed gave fair to high germination in pellets in the laboratory, about the same as for bare seed. No repellents were effective against white-footed mice.

6. Recommendations - Search for more effective repellent.

7. Reporter - A. W. Moore, Biologist.

8. Date - October 21, 1947.

1. Agency - Consolidated Water Power & Paper Company.

2. Species - Balsam fir, black spruce, white spruce.

3. Pelleting materials - Pellets from Processed Seeds, Inc., made of 65 percent feldspar and 35 percent fly ash, plus fungicide (Arasan), rock phosphate, and keto succinic acid, were neutral in pH.

4. Techniques used - Sown covered and uncovered in seed spots in field, on different sites.

5. Results - One season's results showed less germination for pelleted than for bare seed of balsam fir and white spruce. Pelleted seed did better on moist sites than on dry ones. Pelleted black spruce seed in uncovered spots was almost 100 percent better than bare seed. Pelleted seed sown in spring showed lag in germination.

6. Recommendations - More studies needed, especially trying fall sowing.

7. Reporter - E. S. Hurd, Forester.

8. Date - February 21, 1949.

1. Agency - U. S. Fish and Wildlife Service, in cooperation with California Forest and Range Experiment Station.

2. Species - Ponderosa pine.

3. Pelleting materials - Not stated.

4. Techniques used - Pelleted seed with various repellents added were sown on the Plumas National Forest in seed spots, both unprotected and protected with wire screens. For comparison, bare seeds both stratified and untreated were also sown in the same manner.

5. Results - Because of dearth of rodents they did little damage to any of the seed. Germination was somewhat retarded by pelleting. Stratified seed germinated more promptly and completely than any of the others. In unprotected spots pelleted seed germinated 0-60 percent (average 35 percent) as compared to 30 percent for untreated bare seed and 80 percent for stratified bare seed. In screened spots pelleted seed germinated 10-70 percent (average 42 percent) as compared to 90 percent for untreated bare seed and 100 percent for stratified bare seed.

6. Recommendations - Further tests of repellents needed.

7. Reporter - Joseph Keyes, Biologist, through Jack Welch, Biologist, Fish and Wildlife Service, Denver.

8. Date - February 28, 1949.

Suggested Points to Consider When Discussing Sanitary Problems With Village Fathers

1. Obtain general information along lines as indicated on the proposed attached reconnaisance survey form.

2. Determine after conference with the leaders of the village what in their opinion is the work they consider the most important, and would like to have undertaken first.

3. Just to what extent are they in a position to contribute to the project.

4. Be sure that the project agreed upon is so planned that it will fit into and become a part of future work in the village.

5. Have it thoroughly understood that the project is their project, and that they are being given technical assistance and only such financial or other assistance as it is impossible for them to provide for themselves.

6. A very careful examination should be made to determine what equipment should be provided to make it possible for them to help themselves.

7. If a truck is required be sure that its size is such that it can be used in any of the group of villages in which work is to be carried out.

8. If a well drilling outfit is required be sure it is of the type and size that will take care of any demand that may be made on it.

9. If a water system is planned see if it is not possible to locate a well, and storage tank so that they will take care of more than one village.

10. If it is a question of school, what type should be erected, size, location, playgrounds, water supply, toilet facilities, ventilation and light.

11. Slaughter house, size, location, means of disposing of offal, water supply, drainage, etc.

12. If pit privies are to be constructed determine the type of soil, and recommend the pit best suited, lined or unlined, if dry pits. Where water is available a septic tank may be used or a septic privy. There will be few cases where water carriage should be recommended.

13. If dry pits or septic tanks are used care should be taken to see that there is no danger of contaminating wells. This holds also for cesspools or leaching tanks.

14. Show that a properly constructed and maintained compost pit can be a good dividend payer, as well as a sanitary measure.

15. Show the farmer that he can save many times the cost of a rat eradication program.

THE ROCKEFELLER FOUNDATION 1913

INTERNATIONAL HEALTH DIVISION

OF THE ROCKEFELLER FOUNDATION

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SAVE

See pg. 6 47

"What I am trying to say this evening can perhaps best be summed up in two sentences by Lord Stamp, whose death in a London air raid was one of the great losses of the war: 'Any truth is many sided, even simple truth. But the complex truth of today needs approach by many different methods and by many different types of mind before we can arrive at even an approximation of the truth.'

"It is not a segment of the truth that will make us free; it is all the truth - the whole truth, inclusive, interfused, unified, guided by the principle that while a real knowledge of man is impossible without a knowledge of nature, a knowledge of nature is sterile unless it is linked with a wider knowledge of man.

"We are living in a world that threatens to brush aside everything that intelligence stands for. From now on our Dr. Mortons on the frontiers of science will be watched with suspicion. Fear and insecurity will dog the footsteps of this generation like menacing shadows. Over all our work and plans will hang the ominous question: 'Have we time?' But it is unthinkable that reason should utterly surrender to fear, or that hope should lose itself in panic flight. The race with chaos and complexity may be desperately close, but intelligence must persist in trying to keep abreast, an intelligence that is rooted not alone in test tubes and microscopes, but in the whole of life." - Raymond B. Fosdick, from a speech given October 16, 1946, at the centenary of the first public demonstration of ether at Massachusetts General Hospital.

TALK OF THE FIELD

We can think of no better way to start our first 1947 issue of NEWSLETTER than with a description by Mr. Bates of New Year's celebrations in Colombia a year ago. Other countries may have other ways, but New York and Villavicencio appear to have much in common.

"The population of Villavicencio has been finishing the year all week, very thoroughly. Since we in the laboratory have been largely boondoggling anyway, I decided to recognize local custom and make the whole week holiday of a sort, with a system of shifts so that someone would always be on duty and so that all essential routine would be maintained. This produced a quiet atmosphere in which Helen* and I continued our mad course of article writing - finishing the last draft of what I hope is the last yellow fever article on the last day of the year....

"But I started to make some report on the finishing of the year in the town. The town is constantly getting larger, richer, and noisier. This year at Christmas the volume of noise would have been immense in any case, from sheer number of people; but I am convinced that there has also been an increase in volume of noise produced per individual. Probably related to the increase in alcohol per individual."

* * * * * *

One of the main themes we find running through the field diaries is that of transportation difficulties. Automobile tops are mended with adhesive tape; trains are wrecked; planes are late and uncomfortable. Since such annoyances are part of the separate lives of all of you, we think you may be interested and consoled to know what your colleagues are putting up with.

Appropriately enough, we start off with some difficulties encountered by Dr. Balfour on the eve of the last Chinese New Year: "We get started by car to Chengtu with C. C. Chen: en route to see Pishan Health Center.... Continuing en route after 100 km. the Ford spring collapses. We walked to the nearest town, Yung Chuan, and after 4 1/2 hours' labour and NC$ 30,000 repair, we restart in the dusk. After another 20 km. we break down again, stopping near an isolated hut; taken in and fed sweet potatoes by the country folk. We contemplate sleeping in the car, but the bandit stories make it seem a hazardous area. The local Pao chief is called who walks with us the 1 1/2 km. to the nearest market village amidst much fog and mud. With C. C. Chen's influence we finally get a soldier's bed in a Sub-Magistrate's office. GKS and MCB share blankets and bed; notwithstanding the dirt, gloom and hard bed have a fair sleep.

"After breakfast with our host, telephoning produced no results and it seems the Chengtu trip must be abandoned. While waiting for a chance ride our car reappears, miraculously repaired, or at least moveable. We return to Koloshan to find no fire, no cook and no food since it is the beginning of a

*Helen Booth (MB's sec't'y)

2 days' fête. However, Dr. Hsu produced a satisfactory meal and we passed the 'New Year's eve' at bridge."

Dr. Hackett's diary contains an abstract of Bevier's account of a journey taken during August. "Half the month was taken up by a trip of over a thousand miles by car from Cochabamba southward along the eastern face of the mountains as far as Tariza near the Argentine frontier, and then home again via Potosí and across the high plateau. GB was accompanied by Col. Hart of IIAA. Mrs. Hart and Mrs. Bevier joined them at Sucre by plane and went the rest of the way with them by car. I imagine few people have ever made such a trip. Their tires blew out, they got stuck in the snow, they bent their brake rod and fan on a stone in the road and slashed their radiator; their pump became plugged with mud and they spent a cold night in the car at 13,000 feet, and had to break through ice to find water, but they had Jorge, our competent chauffeur-mechanic along. He made one tire out of two, scraped the tar off the battery to mend the radiator, and got them all home - 'a splendid trip', writes George, 'and everyone pleased.'"

Dr. Maier had robbery added to the difficulties of travel: "A long, wearing, dusty, dirty trip, partly on a sandy track across the llanos, and partly on a dirt and gravel highway which gouged large hunks off our tires. Arrived at San Juan de los Morros at dark, my shirt looking like a mud pie, and the Russells not much better.

"Back to Maracay at 7 a.m. Went to our house to get cleaned up, and found that we had been robbed - all our clothes! Police promise recovery and apprehend builder's helper, who slept in house as guard." Dr. Maier is discreetly silent as to the recovery of his belongings, but Dr. Russell completes the story as follows: "Went with JM to local police station where he gained possession of most of his stolen goods, after being photographed in the midst of his property, surrounded by detectives, police officers, and a grinning crowd."

And now, to Brazil and Dr. Hayes. "Arrived in Londrina about 1:30 p.m., having been held up by a broken spring and a few bad stretches of road which were worse as the result of a recent rain. In general, however, the road was much better than those encountered in the vicinity of Passos. My continued respect for the driving of Brazilian chauffeurs was not lessened one whit. Never have I seen more complete disregard of personal safety - and that of the passengers - but they usually arrive at their destination, by virtue of genuine skill in handling a car at high speed on rutted and bumpy dirt roads - and by what appears to be more than their reasonable share of fortune."

If Dr. Wilson ever decides to leave public health, he may be a good candidate for a chauffeur's job in Brazil - at least Dr. Aitken would probably recommend him on the basis of his experience. "I was up at 6:45 this morning, dressed quickly, sent my luggage downstairs, rustled up some breakfast and was on time to meet the chauffeur at 7:45. But no DBW. I called his room and as I found him still in bed, I went to the Air Office (Italian) and reported us both in. I was told that the plane didn't leave Guidonia air field until 10 o'clock. We took our time about getting out to the field, DBW driving - and what a ride,

we went through the city in high speed 'second', the suburbs mostly in 'free wheeling' (on the clutch); and then settled down to 20 m.p.h., until I suggested that it was some little distance out to the field and perhaps we should step on it - which he did! When we arrived at the field we drove right up to the plane....and they hustled us aboard."

Perhaps it will be better for all concerned if our staff stay away from the controls of high-speed machines. Dr. Hackett provides corroborative evidence of this. "I flew to Trujillo with a jolly man named Sage who invited me to occupy the co-pilot's seat. He explained all the dials and other gadgets and pretty soon I was flying the plane, and would have attempted a few loops and perhaps a falling leaf just to amuse the passengers, but Sage thought it inadvisable since we were flying at 600 feet."

India is just as exciting as South America for air travel, as Dr. Watson can testify. "MCB saw me off on the noon TATA plane for Bombay.... There was an all-Indian crew and this did not inspire confidence. The day was hot and the air bumpy and many of the Indians got very ill. So the pilot went up to around 16,000 feet (on his statement) and I was cyanotic and bitterly cold. Then too, the pilot invited the Indian passengers to the flight deck to view the country from his seat. We made one stop, at Ahmedabad, a blisteringly hot place. Maybe because of the hot air, the pilot came into the field under power and I think without wing flaps. We hit the runway at high speed, bounced high and dropped one wing nearly to the ground, hopped along like a bird and finally came to rest. Going in to Bombay, we repeated the procedure and I quit playing with the idea of coming back to Bombay from Poona in order to fly to Madras with Messrs. TATA in order to save the long train trip across Southern India."

But four days later Dr. Watson was off on a train trip which was to prove equally exciting, if not as dangerous, as the flight to Bombay. "We took the night train for Bangalore and I had a two place compartment. We arrived an hour early as usual to battle our way through the crowds and to insure getting a place on the train. A reservation does not necessarily provide a place, and travel in India seems to be on a first come first served basis. The names of occupants of sleeping cars are posted outside the compartments and this time I noted that I was listed for the upper and some unintelligible name was listed for the lower. My ticket having been checked, Abdul made up the lower for me and suggested that I lock the door and let no one in. This seemed rather high handed to me; besides, I couldn't stay in the car with the door shut since the fan wouldn't work until the train started and the place was like an oven. People would come up and look at the placard and move on, but, just before we started, in came a very fat man and asked if he could share the compartment, since he was only going to the second stop. I thought he was the other passenger but later he turned out to have no reservation. He was drunk on beer he said and I think he was German or Dutch from his accent. He climbed into the upper and went to sleep, finally leaving the train at 2:30. After this I slept more restfully, the papers recently having recounted several murders in coupes.

"Abdul confessed on inquiry that the other name on my compartment had been placed there by himself, or by someone in collusion with him, to give me more privacy."

Tied up with uncertain means of transportation is the question of hotel rooms. Our men get so hardened that Dr. Downs, for example, can coolly admire a display of skill by Mr. Gahan, who "showed his professional capabilities the next morning, by capturing several fine bedbugs."

But perhaps no one can find a hotel exceeding in discomfort that encountered by Dr. Hayes. "This time we had not had a good night's rest, owing to the fact that we had stayed at the Hotel -----, presumably the best of four in the town. This hotel was without doubt the dingiest excuse for accommodation of travelers that I have as yet encountered. Cleanliness was totally absent and the room which Arlindo and I occupied, a small affair containing two beds and a table with scarcely room to turn about, had obviously not been touched by a broom for three to four weeks and the bed-linen looked as if it had been in situ since the hotel was inaugurated. There was a dirty tablecloth on the table on which were a half-filled glass of water with fungus growing in it, some spilt sugar and a pile of cigar ashes. The portable sanitary convenience had not been emptied and did not improve the atmosphere. We were given a dinner which Arlindo, accustomed as he is to frugal repasts, could not stomach. Coffee the following morning was a dilute affair. The only advantage to the hotel was that our stay, including dinner (?), bed(??) and coffee cost us only Cr$ 12.00."

A letter from a Puerto Rican quoted in Bennett Cerf's column in the Saturday Review of Literature sums up, albeit in imperfect English, both transportation difficulties and insect annoyances such as are described by Mr. Bates on page 5.

"Very Friend:

"Good morrow. What passes with you?....The clock of the wrist just terminates to give eleven. It is the hour when the mosquitoes pick me with their little picks and I have a need to sit me in the office holding a kill-fly in one hand and a feather-fountain in the other. This night, however, I do not use the feather-fountain, but I play with the two hands on the machine of writing, and thus it is a need to contain the kill-fly between the teeths.

"Before yesterday, I has a desire to buy me a car, but it is sufficient difficulty to obtain new gums, and without new gums, the air which should remain within the new gums arrived to be outside, the which is sorrowful condition in relation to the car. For this motive I guide a bicycle in the present little moment. I stay me content with this, except that sometimes the fingers of my feets put themselves tired to make move the wheels. I must then remember me to keep hard the little gums for to alleviate the pushing of the pedals. Always there is a station of pumps in the aroundness, where the gums can fill themselves when they arrive to be vacant.

"Thus till the sight,

"Your most very servant...."

NOCTURNAL CONFLICT*

Everyone is familiar with mosquitoes. The unfortunate people who have not ventured outside of the segment of western civilization characterized by modern plumbing may rightly disclaim any acquaintance with bedbugs or lice or ticks or leeches or even fleas, but we have all encountered mosquitoes on picnics, if not in the bedroom. And most of us have repeatedly suffered that desperate nocturnal conflict with a single mosquito that finds some hole in the screening and triumphantly buzzes first in the left ear and then in the right before settling down to test the blood supply on the exposed right shoulder. It is just a test, because the mosquito is already gone when you make the first swat. I have spent many hours of my life inside large cages with mosquitoes, watching the intimate details of their life, including their individual and collective idiosyncrasies as they bite. I think I have learned a lot about the character traits of Anopheles maculipennis and Culex pipiens. But none of this knowledge is of any avail during that midnight struggle. After that first swat, my body tenses in expectation of the next point of attack; I think I feel a prick and swat again, but the buzz in the right ear tells me that the prick was probably one of those tricks of sense perception that the psychologists are always fussing with. I decide that the proper course is to let the mosquito settle down and fill up with blood, so that she will go off in a corner somewhere to start the digestive process and stop this silly braggart buzzing. I try to relax, and presently a series of sensations at one side of my nose informs me that the mosquito has really settled down. I begin to think, why let the brute get away with this? The proboscis is surely well inserted by now and the mosquito sufficiently preoccupied with finding a capillary so that I'll be able to get in a really crushing swat. I cautiously remove my arm from under the bedclothes and with infinite patience bring it into position for the blow, which is delivered with speed and precision. I feel my bruised nose cautiously to see whether I can detect the squashed mosquito. Nothing, but I think maybe the body fell off onto the sheet. But a minute later there comes that damned buzz again. So I crawl wearily out of bed to get the bottle of di-methyl-pthalate from the bathroom, and after smearing my face with due regard to eyebrows and eyes (conditioned from times when I didn't take due regard), I sink back into sleep, still too mad at the Culex to be properly grateful for the chemical accomplishments of modern science.

* from unpublished Bates manuscript

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Dr. Muench, now in the Department of Biostatistics at Harvard, sends this Christmas message: "This is the first time in many a year that I am missing the office Christmas party and I must admit to a little twinge of homesickness on the occasion. The Rockefeller Cell at the Harvard School of Public Health unites in sending all the best wishes of the season to the Foundation in general and to each friend in particular."

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According to extensive research conducted by the indefatigable Dr. Gallup, coryza, or acute catarrhal rhinitis, or the common cold, afflicts at this time of year some 18,000,000 U. S. citizens, or almost 15 per cent of the population. This percentage tends to be constant until Christmas, when it usually begins to increase. By February, the peak month, approximately 25,000,000 people have colds. Thereafter the figure declines until it hits its annual low in mid-July - 6,500,000.

Well ..... Season's Greetings!

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CANDLES IN GREECE

According to reports in the papers, they're burning candles in remote villages in Greece these days for a U. S. Army engineer named Col. Daniel E. Wright who has virtually driven the malaria scourge from the country in the past year. Wright has been a member of the I.H.D. since 1930 but has been on leave since 1941.

Col. Wright's administration of the UNRRA malaria control program in Greece provides one of the few bright spots in the recent melancholy history of this war-ravaged, exhausted nation. Using DDT on a national scale anywhere for the first time, Wright planned and executed what was literally a strategic air offensive against the mosquito larvae in the 600-odd square miles of swamp-land on the mainland of Greece and its island of Crete.

Eighteen planes piloted by fliers of the Greek Army airforce "bombed" and sprayed the larvae areas with DDT for months in a sustained operation. Not a single breeding-ground in the whole country was missed. "It was a strategic bombing campaign, all right," said Col. Wright. "Everything was just as planned, coordinated and synchronized as in war. The big difference was that we were bombing for life instead of death."

The figures tell the story of victory; in a country which counted three million malaria cases out of 7,000,000 population in 1942, the malaria rate is practically zero today. The few score cases reporting to clinics for treatment have been diagnosed as relapses. Not a single new case of malaria has been reported on the whole island of Crete.

Indirect gains are almost equally impressive. The DDT which wiped out the mosquito larvae, also killed off flies and sand fleas which transmit the germs of diarrhea, trachoma, dysentery and other diseases endemic to Greece.

One doctor in a formerly malarious region of Macedonia addressed a mock complaint to Col. Wright:

"I have given only one quinine injection this year. You have ruined my malaria practice and the end of my trachoma and dysentery practice is also

in sight. Thanks to you I shall probably also lose my pneumonia cases, because if public health continues to improve at this rate most people will surely have the resistance to ward off pneumonia this winter. But what's going to happen to me?"

* * * * * *

Dr. Harry S. Mustard, formerly a Scientific Director of the I.H.D., has been elected President of the American Public Health Association.

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Bits from a letter bravely written in English by a fellow from Korea:

"I stopped at Buffuro on the way and both of us visited the famous Niyagra Fall in the afternoon of 20th. We really did enjoyed so much when we could look at the Fall. I would say, it is quite wonderfull scene ever I saw. After one night stop at Buffuro Hotel, we came to here Philadelphia through the mountain area in the train. The river water was so clear when I compair with the water of Southern Part of America which I saw in last couple of month as a muddy....Philadelphia is quite busy as much as New York and the street is so narrow that become dizzy when I walk the street.....I worry about the political situation of Korea. This is a most anxious hard problem to get solve by somebody senior than I...Better close here because of my bed time."

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THE LASKER AWARDS

The I.H.D. is proud that Dr. Soper was among the first group of persons to receive the newly established Lasker Awards. He was cited for "his splendid organization of eradication campaigns against yellow fever and malaria which have set new standards in the fight to defeat these diseases."

The Albert and Mary Lasker Foundation in 1946 offered - through the medium of the American Public Health Association - a series of annual awards for outstanding achievements by individuals or by health or welfare agencies in research and in the administrative application of research, with special reference to those diseases which are the major causes of death. "Included in this purpose are the prevention of these diseases, their treatment, and their most effective care. Particularly it is desired to increase the information possessed by the public health professions about these most frequent causes of death, to inform the general public of new methods to increase the health and satisfaction of those in the later years of life, and, wherever possible, to shorten the time between the discovery and application of useful knowledge." The Committee on Awards is empowered to withhold awards entirely if no research projects in any year in the chosen area are, in its opinion, worthy of recognition.

The other individual awards went to A. N. Richards of the University of Pennsylvania for the development of the penicillin program and other activities of the Committee on Medical Research of the O. S. R. D.; John F. Mahoney, of the U. S. Public Health Service, for his outstanding leadership in the treatment of syphilis by penicillin and other new procedures; Karl Landsteiner (who died three years ago) and his colleagues, A. S. Wiener and Philip Levine, of the Rockefeller Institute, for their basic researches on the Rh factor; and Carl F. Cori of Washington University for his studies on carbohydrate metabolism and the mutual reactions of hormones in the human body.

The five group awards were all given in recognition of the outstanding development of cooperative research made by official and semi-official boards and commissions in meeting the emergencies of the war. One of the group awards was given to the Army Epidemiological Board of which Dr. Andrew J. Warren was a member.

The awards which Dr. Soper received consisted of a check and a gold statuette of the Winged Victory, and were presented at the A.P.H.A. meetings in Cleveland in November. In his absence, in Egypt, Dr. Wilson accepted the award on behalf of Dr. Soper.

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Translation of a detour sign in Peru:

Mr. Traveler: We ask you to excuse the trouble to which you are put in going around this construction area. Just think that we are making a road which will enable you to travel comfortably and safely.

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MALARIA IN THE NETHERLANDS

During the war very large areas of Holland were flooded by the Germans. Since the end of hostilities all of these newly flooded areas have been drained and the land reclaimed, but there are still in the reclaimed territory depressed areas filled with water which constitute scattered anopheles breeding places. Also, there are a number of other areas where it will take several years to complete reclaiming operations.

Unlike other parts of Northern Europe, the Netherlands has continually had areas of endemic malaria. Although the incidence of the disease has

decreased greatly in modern times in comparison with the eighteenth and nineteenth centuries, since 1900 several upsurges of epidemic proportions have occurred. Thorough studies of the local epidemiology have failed to make clear the causes of these outbursts.

In the meantime, with the extension of anopheline breeding areas, malaria rates in Holland have increased considerably within the last few years. The first two thirds of 1946 brought 8,000 cases, as compared with about 700 in 1941. The situation is even more serious because of the fact that undernourishment is increasing mortality from the disease.

The I.H.D. has given $2,500 to the National Health Department of Holland as aid during 1947 in conducting a general malaria survey to ascertain the extent of mosquito breeding and malaria infection and to determine the best measures of control.

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BOOKS

Thunder Out of China, Theodore H. White and Annalee Jacoby. William Sloane Associates, Inc., New York, 1946. 331p. $3.

An up-to-the-minute account of what has happened in the last two years in China, caught in the grip of war and revolution. Many personalities are presented but the underlying concern is with the people of China and the historic causes of their troubles. Earnest, thoughtful and factual.

5000 Years of Art, Aline B. Louchheim. Howell, Soskin, New York, 1946. 199p. $3.50. (Illustrated)

This new book differs from other histories of art in two respects. It is not alone a pictorial history accompanied by text, but the pictures that tell the story are drawn entirely from the readily available resources of the American reader. It therefore strengthens actual art experience instead of providing it in the abstract. The illustrations are supplemented by an "almanac" relating respective epochs and places of art to contemporaneous developments in politics, the sciences and other arts. The book deals with exclusively Western art and is written in a simple, swiftly-moving style.

Atomic Energy in Cosmic and Human Life, George Gamow. The Macmillan Company, New York, 1946. 161p. $3.

You don't have to remember whatever you may have gleaned in a distant past about nuclear physics in order to understand this brief, well-written treatise.

Miracles from Microbes, Samuel Epstein and Beryl Williams. Rutgers University Press, 1946. 155p. $2.

Another book for the layman. It may be an old story to public health men, but here are all the details on the birth of the famous triplets, tyrothricin, penicillin and streptomycin.

Penicillin: its practical application. Alexander Fleming (Ed.) Blakiston, Philadelphia, 1946. 380p. $7. (Illustrated)

A more inclusive book on penicillin, covering history, chemistry, pharmacy, pharmacology, bacteriology, methods of administration, and a clinical section on a wide variety of subjects, including a chapter for the general practitioner. Good general discussion of the use of penicillin in England for almost all infections.

Hiroshima, John Hersey. Alfred A. Knopf, New York, 1946. 118p. $1.75.

You may be interested to know that this classical essay of 1946 is available in book form.

STAFF NEWS

Dr. M. C. Balfour went to Korea toward the end of the year at the request of the military authorities there to look into the public health situation. At present, he is in India and, with Miss Corwin and Miss Tennant, is visiting public health nursing activities. He and Miss Tennant expect to go on to China early in February.

Miss Nina Balfour reached Shanghai October 15, and at present is working with the Strategic Services Unit, formerly the OSS and now a unit attached to the U. S. Navy.

Dr. and Mrs. Marston Bates and their family arrived in Miami on October 9 from Colombia on accumulative leave. The latter part of November, with their daughter Sally, they spent some time in New York, after which Dr. Bates visited various scientific institutions and individuals in Boston, Cambridge, Baltimore and Washington to confer concerning his particular field of interest. In January he hopes to visit the TVA before sailing for Colombia the end of the month.

Dr. Bates reported briefly at the meeting of the Scientific Directors on December 13, on some of his plans and hopes for future work at Villavicencio.

Dr. and Mrs. Johannes H. Bauer, we understand, have finally succeeded in finding an apartment at 4 rue de Mignard, Paris 16, and expect to move in during January. Unfortunately, however, the apartment apparently is available for a period of months only.

Dr. Mark F. Boyd spent the period September 15 - October 3 in Mexico for the purpose of conferring with Dr. Downs about the malaria work being carried on there.

Miss Elizabeth W. Brackett arrived in New York November 25 on the SS WESTERDAM for conferences and leave, and plans to return to her post in the Paris office around the end of February.

Dr. John C. Bugher attended the APHA meetings in Cleveland in November. Shortly before that, he and Mrs. Bugher left for a vacation trip which took them to California, Washington and Oregon. The first of January they returned to New York, and expect to sail for Lagos, Nigeria, West Africa about January 24.

Dr. Henry P. Carr left Ciudad Trujillo January 5 for Venezuela to attend the Malaria Conference, the XII Pan American Sanitary Conference and the II Pan American Conference on Sanitary Education.

Dr. Wilbur G. Downs attended certain sessions of the Fifth Brucellosis Congress and the First Inter American Brucellosis Congress in Mexico City from October 28 to November 1.

Dr. Monroe D. Eaton arrived in New York December 30 for visits and conferences at the home office and the Laboratories, and to deliver a series of lectures on virus diseases to medical and graduate students at Harvard.

Dr. John E. Elmendorf, Jr. is now on terminal leave from the Army. He expects to complete his leave late in the spring.

Professor Gordon M. Fair, a member of the Board of Scientific Directors, and Abbott and James Lawrence Professor of Engineering and Gordon McKay Professor of Sanitary Engineering, assumed the office of Dean of the Graduate School of Engineering at Harvard on July 1, 1946. In addition, he is actively associated with the School of Public Health, giving instruction to public health students and serving as a member of the Faculty of Public Health and as Head of the Department of Sanitary Engineering in the School of Public Health.

Dr. E. W. Flahiff, former member of the Division's staff, recently wrote as follows: "....I stayed in the Army until September of this year (1946) after returning from overseas in October 1945. In Canada I was working at military headquarters in Halifax and London, Ontario. Since retirement in September, I returned as Medical Superintendent in the Tuberculosis Sanatorium at Haileybury, Ontario, for six weeks and was then offered the job as Chest Examiner for the Workmen's Compensation Board in this District. The work, being almost entirely among gold miners, has to do with tuberculosis and silicosis. I am enjoying it very much so far." He gives his address as Box 154, Kirkland Lake, Ontario, Canada.

Dr. John P. Fox attended a Symposium on Rickettsial Diseases in Boston from December 26-28. This was held in connection with the AAAS meetings.

Dr. John B. Grant, since the October NEWSLETTER, has made the following visits in connection with his medical care activities: Health Institute and Washington University in St. Louis in October; the Kellogg Foundation at Battle Creek, Michigan; USPHS, Washington; Johns Hopkins, Baltimore; Winnepeg, Canada, to present the report on personnel training requirements of the Health Services Act of the Province of Manitoba prepared by Miss Tennant, Dr. Grant, Dr. McIntosh, Dr. Smith, and Dr. Leavell, the latter formerly with the Medical Sciences of the Foundation; Saskatoon, Saskatchewan, Canada, to confer with the Governing Board of the University, Hospital and Advisory Council of the College of Medicine at the request of the Minister of Public Health. He also attended the meetings of the APHA in Cleveland in November.

On December 5, Dr. Grant sailed on the SS AMERICA for Europe. He expects to be gone until early March, and while abroad, plans to visit England, France, Holland, Finland, Norway, Sweden and Denmark, as well as South Africa.

Dr. and Mrs. L. W. Hackett arrived in New York October 14 from South America on accumulative leave. After official visits in the East, on November 30, the Hacketts reached California where they plan to spend most of their accumulative leave. Their address is Hotel Claremont, Berkeley 5. They plan to leave Berkeley about February 1 to return to Buenos Aires; en route they hope to stop in Mexico, Panama, Colombia, Venezuela, Ecuador, Peru, Bolivia and Chile, probably reaching their destination about the middle of April.

Dr. A. J. Haddow was very sick this fall with an undiagnosed illness suspected of being a virus infection of some sort. We are glad to report that he seems now to have recovered completely.

Dr. Richard G. Hahn attended an Anglo French Conference on communicable diseases held in Accra on the Gold Coast November 12.

From November 22 to 29 he and his family spent local leave at Tarquah Island.

Dr. Rolla B. Hill returned to the U. S. early in December and joined Mrs. Hill in Baltimore. For the first time in many years the whole Hill family celebrated Christmas together. Dr. Hill returned to Bogotá by air from Miami December 30. On January 5 he went to Venezuela to attend the Malaria Conference. Mrs. Hill is still in the U. S., and her address is 1816 West Baltimore Street, Baltimore.

Dr. Hill has been appointed by Dr. Strode to serve as Regional Director of the Caribbean area to succeed the late Dr. Crawford.

Dr. John H. Janney will attend the Venezuela conferences during January. Miss Mary Janney left the U. S. by air December 31 to spend her vacation of several weeks with her family in Santiago, Chile.

Dr. John F. Kendrick, we are glad to report, has made a satisfactory recovery from a heart attack suffered December 18.

Dr. and Mrs. Henry Kumm had their three children with them for Christmas. This was the first Christmas the whole family has been together for several years.

Dr. Charles N. Leach returned to Paris in November, sailing on the fourteenth from New York on the first trip of the SS AMERICA since its conversion from a troop ship. Early in December he visited Italy and Sardinia with Mr. Logan and Dr. McCoy. He expects to go to Austria early in January.

Mr. John A. Logan and Dr. McCoy made a trip to Holland in October especially to observe and report on the malaria situation there.

Mr. E. H. Magoon left Havana November 14 for visits to Salvador and British Honduras. On January 2 he went to Venezuela to attend the malaria conference, after which he will visit Jamaica and British Honduras, returning to Havana early in March.

Dr. John Maier is planning to attend the malaria and sanitary conferences in Venezuela in January.

Dr. W. A. McIntosh was in New York City for a few days toward the end of October for conferences at the home office and to attend the budget estimate meeting of the Scientific Directors held November 1. Shortly after this, Dr. McIntosh attended the APHA meetings in Cleveland.

Dr. D. F. Milam also was in Cleveland, November 12-14, for the meetings of the APHA.

Dr. George C. Payne attended the APHA meetings in Cleveland in November. In December, he visited IHD fellows at the Harvard School of Public Health, and at the Johns Hopkins School of Hygiene. Early in January he will go to Battle Creek, Michigan, to visit activities of the Kellogg Foundation and on to Ann Arbor to see IHD fellows at the University of Michigan School of Public Health. At the same time, he will visit the Detroit City Health Department.

Miss Persis Putnam plans to leave about the middle of January to spend approximately six weeks at the Tallahassee Laboratory with Dr. Boyd.

Dr. E. R. Rickard presented a paper on "Typhus Fever Studies in Florida" before the meeting of the Florida Public Health Association in Miami October 14-15. He also attended the meeting of the Southern Medical Association held in Miami, November 4-7, where he gave a paper entitled "Typhus Fever in Florida" before the Section of Public Health.

Dr. and Mrs. Paul F. Russell sailed from New York November 2 for Maracay, Venezuela. The ship on which they sailed went only to Cumana, where they were met by Dr. Maier. They then proceeded overland by car — and a very rough trip it was — to Maracay, arriving November 15.

Dr. Russell expects to attend the malaria and sanitary conferences in Venezuela in January.

The Walter Reed Medal was awarded Dr. Russell at the meeting of the American Society of Tropical Medicine held in Miami in November. Since Dr. Russell was en route to Venezuela at the time of the meeting, it was accepted on his behalf by Dr. Strode. It was awarded on the basis of the following accomplishments:

1. Differentiation of the larvae of the three common anopheles of the Southern U. S.

2. Clarification of the transmission of malaria in the Philippine Islands together with other epidemiological work there, and the encouragement of the development of Totaquine in the Philippines.

3. Studies of the epidemiology of malaria in India and pioneer work in the use of spray-killing of adult mosquitoes.

4. Inauguration of malaria survey teams and malaria control teams for the Army during World War II, and supervision of malaria control in the North African and Italian Theaters of Operation.

5. Publication of a book on malaria.

Dr. Hugh H. Smith attended the meetings of the American Society of Tropical Medicine in Miami, November 4-6, and the APHA meetings in Cleveland November 10-14. Following the latter meetings, he visited the Kellogg Foundation in Battle Creek, Michigan. He spent December 19 in Boston conferring with various individuals at the Harvard School of Public Health.

Mrs. Kenneth C. Smithburn returned to the U. S. the end of November on account of the serious illness of her father. According to news at Christmas time, his condition had greatly improved, and she thought she might be able to return to Entebbe early in the year.

Dr. Smithburn has been elected an honorary member of the British Medical Association, Uganda Branch, in appreciation of "considerable work devoted to the cause of furthering medical knowledge in this country."

Dr. Fred L. Soper reached Boston December 24 from Cairo. While there he attended the AAAS Symposium on Rickettsial Diseases. He arrived in New York December 29, and was to leave Washington January 8 to attend the XII Pan American Sanitary Conference and the II Pan American Conference on Sanitary Education as an official delegate. Mrs. Soper will accompany Dr. Soper to Venezuela.

Dr. George K. Strode attended the meetings of the American Society and Academy of Tropical Medicine in Miami, November 4-6. At that meeting, he was elected President of the American Academy of Tropical Medicine for the ensuing year, and also appointed Chairman of the Committee on International Health and Tropical Medicine of the American Society of Tropical Medicine primarily to assist in the planning of the International Congress in 1947 of Tropical Medicine.

Dr. Strode and Dr. Smith, accompanied by their wives, are visiting the cooperative IHD activities in Mexico from January 5-22. En route back to New York they will stop in New Orleans for a visit to Tulane University. Toward the latter part of March, Dr. Strode is planning to leave New York for Europe.

Dr. R. M. Taylor returned from his Brazil visit October 18. In November he attended the meetings of the APHA in Cleveland. From December 26-28, he was in Boston for the Symposium on Rickettsial Diseases.

Miss Mary Elizabeth Tennant visited the IHD nursing fellows at the Toronto School of Nursing from October 7-12. The latter part of October she also visited fellows at the Yale School of Nursing. In November she went to Cleveland for the meetings of the APHA and to see the IHD nursing fellows at Western Reserve University. On November 29 she arrived in Cairo by air, and on December 24 reached Delhi, India. She expects to return to New York about the middle of March.

Dr. Andrew J. Warren, on November 25, attended a meeting of the Tropical Diseases Study Section of the National Institute of Health in Washington, D. C. In November he was appointed a member of the Honorary

Membership Committee of the American Society of Tropical Medicine. He is to attend a special meeting at the State Department on January 10. The meeting is being called to consider problems of the South Pacific. Dr. Warren will give a brief report on IHD program.

During Dr. Strode's absence in Mexico, Dr. Warren is serving as Acting Director of the Division.

Mrs. R. B. Watson and her children arrived in Shanghai on October 15.

Dr. and Mrs. John M. Weir and their children are planning to sail early in February for Cairo, Egypt, which will be Dr. Weir's next post.

Dr. C. W. Wells visited the Standard Oil Company in Salta and Tartagal the end of July and early August to confer with the doctors in both towns concerning the control and epidemiology of tuberculosis. During Dr. Hackett's leave, Dr. Wells is serving as Acting Regional Director for the Andean and Rio de La Plata region.

Dr. D. Bruce Wilson has been gravely ill with virus pneumonia in the Toronto General Hospital. He was to have sailed for Egypt December 27, but started running a fever on December 18 and shortly thereafter his illness was diagnosed as virus pneumonia. According to latest reports, his condition has improved considerably and it is believed that he is on the road to recovery, but it is probable his convalescence will be a long one.

Mr. D. E. Wright turned up in New York quite unexpectedly on December 9. After spending a day or so here, he went on to St. Petersburg, Florida, to visit his family whom he had not seen in three years. His leave of absence from the IHD for service with the USPHS and UNRRA terminated December 31.

Word has recently been received of the award to Mr. Wright, by the Academy of Athens, of the Silver Medal for valuable services to Greece.

BIRTHS

To Mr. and Mrs. William H. Scott, a daughter, Huldah Ann, on October 21, 1946; weight 7 lbs., 7 oz. Mrs. Scott is the former Huldah Warren, younger daughter of Dr. and Mrs. Andrew J. Warren.

With sincere apologies to the McCoys, we correct the information given in the October NEWSLETTER concerning the birth of Charles Palmer. He was born September 11 and weighed 7 lbs., 9 oz.

DEATHS

Miss Mary Beard, seventy, former Associate Director of the I.H.D. and Director of the American Red Cross Nursing Service from 1938 until her retirement in 1944, died on December 4.

Miss Beard was known throughout the world as a nurse and an educator of nurses. She had studied in England and in virtually all the countries of Europe; in China, Japan and other nations of the Far East; in Egypt, Palestine, Turkey, Syria and Greece. She fostered the establishment and development of nursing schools in the United States and abroad. Her work of administering the huge and complicated Red Cross nursing program during the war alone would have won her fame. But at the same time she was first chairman of the Sub-committee on Nursing of the Health and Medical Committee of the Council of National Defense, and she helped organize the Nurses' Aid Corps, which speeded the release of nurses from civilian hospitals for military service.

Among her many other activities was the work she did for the Foundation. In 1924, she went to England to study maternal care under Foundation auspices; and in 1925, she was appointed special assistant to the Director of the Division of Studies of The Rockefeller Foundation, to work on studies of nursing education. Later she became Associate Director of the International Health Division, a position she held until she joined the Red Cross. She traveled to the Philippines, Siam, Burma and India.

Miss Beard helped establish, and later became president of, the National Organization for Public Health Nursing. She wrote many articles for magazines, made many speeches on nursing, and was the author of the book, The Nurse in Public Health.

* * * * * *

On December 27 Dr. Porter J. Crawford died of a heart attack at the Anglo-American Hospital in Havana. He had been a member of the I.H.D. for 18 years.

Born in Seville, Ohio, on May 29, 1895, Dr. Crawford studied at Western Reserve Medical School and Johns Hopkins. After several years of private practice and work with the public health administration of Ohio, he joined the I.H.D. in 1928. From 1928 to 1934 Dr. Crawford was in Brazil, studying measures for the control of yellow fever. The next three years he served in Panama, doing general public health work, principally concerned with malaria. In 1939 he became Regional Director of the Caribbean area.

Dr. Crawford was consultant in public health to the Republic of Panama from 1936 to 1940 and was decorated by the Cuban Government in 1940 with the Order of Merit, "Carlos J. Finlay." He contributed to the journal, Higiene y Sanidad in Panama.

Modest, unassuming, patient and kind, always helping rather than hurting people, unusually competent administratively and yet quite single in his devotion to the furthering of science, Dr. Crawford, who was much too young to die, will be missed by many.

The address of Mrs. Crawford for the time being is 311 Haskins Road, Bowling Green, Ohio. Elizabeth Crawford is attending Swarthmore College at Swarthmore, Pennsylvania. James T. Crawford is at Hiram College, Hiram, Ohio, and Porter F. is at Charlotte Memorial Hospital, Charlotte, N. C.

Word has been received of the deaths this fall and winter of the mothers of Mrs. John C. Bugher, Mrs. Rolla B. Hill and Mrs. Fred L. Soper, and of the father of Mrs. John Maier, and of the Boyd's granddaughter, Jenny Henderson.

RESIGNATIONS

The resignation and retirement of Dr. Mark F. Boyd from the staff became effective December 31. Dr. Boyd had been a staff member since 1921. With the exception of the period 1922 to 1926, when he was stationed in Brazil, the major portion of his service was in the United States. From time to time he made short visits to various countries as consultant in malariology. He served from 1931 until his retirement as Director of the Malaria Research Station at Tallahassee, Florida.

During the coming year he expects to devote his attention to completion of scientific papers relating to his work.

Dr. Boyd's address in Tallahassee remains the same.

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The resignation of Dr. A. F. Mahaffy from the staff of the Division became effective the end of 1946. He had been with the organization since 1923. During his entire period of service with the I.H.D., his work was concerned with yellow fever, first in Brazil, and later in Lagos, Nigeria, and Entebbe, Uganda. In 1934, he spent a brief assignment in the IHD Laboratories in New York, and in 1934-1935, was in Toronto on study leave. Shortly after this, he was stationed at the Wellcome Institute in London for a year to demonstrate yellow fever vaccine manufacture techniques.

Dr. Mahaffy is now Special Medical Adviser to the Colonial Medical Research Committee and is stationed in London where his address is: Colonial Office, Palace Chambers, 9 Bridge Street, S.W. 1.

NEW SCIENTIFIC DIRECTORS

At the meeting of the Trustees of the Foundation held December 4, at Williamsburg, Virginia, Dr. Eugene L. Bishop and Dr. Rolla E. Dyer were elected members of the Board of Scientific Directors for the three-year term beginning January 1, 1947.

Dr. Bishop, who is Director of Health of the T.V.A., has served two previous terms as Scientific Director. He received his M.D. from Vanderbilt University in 1914, and his M.P.H. from Hopkins in 1939. He has served in

Tennessee as Field Director of the State Board of Health, Director of Rural Sanitation, Assistant Commissioner and Commissioner of Public Health. He has also been Lecturer and Assistant Professor of Medicine at Vanderbilt.

Dr. Dyer is Director of the National Institute of Health in Bethesda, Maryland. He received his M.D. from Texas University in 1915. He has served continuously with the USPHS since 1916, as Assistant Surgeon, Passed Assistant Surgeon, Surgeon, Senior Surgeon, and finally as Assistant Director and Director of the National Institute.

FORM 196

CONSIGNEE

MR. DANIEL E. WRIGHT
WORLD HEALTH ORGANIZATION
9 ELEFTERIOU VENIZELOW STREET
ATHENS,
GREECE

THE ROCKEFELLER FOUNDATION

PACKING LIST
AND
COMMERCIAL INVOICE

DATE JULY 22, 1947

CASE	ORDER	SUPPLIER	CONTENTS	DIMENSIONS	GROSS LBS.	GROSS KILOS.	NET LBS.	NET KILOS.	VALUE	REMARKS
1	418815	ELI LILLY AND CO.	300 CAPSULES — ACIDULIN	0/7X0/7X0/5	2		2		$ 4.59	PACKAGE CONTAINS THREE BOTTLES OF 100 CAPSULES EACH.

MARK>

MR. DANIEL E. WRIGHT
WORLD HEALTH ORGANIZATION
5TH FLOOR
9 ELEFTERIOU VENIZELOW STREET
ATHENS,
GREECE.

WE HEREBY CERTIFY THAT THIS INVOICE IS TRUE AND CORRECT.

THE ROCKEFELLER FOUNDATION

SPECIAL ATTORNEY

C. 1946.

NEW QUARTERS FOR THE LABS

The International Health Division's New York Laboratories, which have been housed at the Rockefeller Institute since their establishment in 1928, are going to move into larger and more convenient quarters. At present they occupy one floor of the North Building and scattered parts of three floors. More unified quarters have been urgently needed for some time, and these are now made possible by the Institute's action in setting aside for Foundation use the two top floors (the fifth and sixth) of the North Building. The sixth floor is a set-back structure, slightly smaller than the floors below, and the plan is to make it into quarters for the experimental animals, while the spacious fifth floor will house the various specialized laboratories and staff offices. In addition to these upper floors, the Institute has assigned space on the ground floor for the use of the ultracentrifuge, the electron microscope and other physical research apparatus. The work of remodeling may be delayed due to government restrictions on building.

Diseases currently under investigation in the Laboratories are typhus, influenza and malaria, with the largest group working on malaria. A few years ago the primary interest here was yellow fever, and the shift of emphasis follows the revision of program outlined by Dr. Strode last year.

Dr. Richard M. Taylor is the new director of the Laboratories, succeeding Dr. J. H. Bauer, who was recently assigned to work in Europe. Malaria research is in charge of Dr. Max Theiler, influenza research is under Dr. Geroge K. Hirst, and typhus research under Dr. John C. Snyder, with physical research under Dr. E. G. Pickels. The permanent personnel now numbers 8 staff scientists and 27 technicians and other helpers, a total of 35 - to compare with three who constituted the entire staff at the beginning 18 years ago.

The program of production of yellow fever vaccine ended in December 1945, after more than five years of work during which over 30 million doses were produced. The vaccine still on hand will serve to meet outstanding obligations to the United States Army and Navy and also to take care of any unforeseen demands; seed virus of the 17-D strain is being kept against the possibility of loss. The manufacture of the vaccine has been taken over by the National Institute of Public Health, Bethesda, Maryland; Instituto de Estudios Especiales Carlos Finlay, Bogota, Colombia; the South African Institute for Medical Research, Johannesburg, South Africa; and Wellcome Institution for Medical Research, London. In addition, the King Institute in India was supplied with seed virus for vaccine manufacture. The Serviço Nacional de Febre Amarela in Rio de Janeiro was producing yellow fever vaccine before the war and is one of the accredited institutions to continue production.

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BOOK NEWS

Voluntary Health Agencies: An Interpretive Study. Selskar M. Gunn and Philip S. Platt. With a forword by Louis I. Dublin. Under the auspices of the National Health Council. $3. pp. 364. New York: Ronald Press Company, 1945.

This study was made possible by a grant from The Rockefeller Foundation, and had as its purpose the study of voluntary health agencies to ascertain their degree of efficiency and to find out whether more could be accomplished by pooling their resources. The book is a description of the problem from the standpoint of what constitutes a voluntary health agency, what its social values and functions are, and where such agencies are lacking. Recommendations are presented as to how the effectiveness of health agencies might be increased. Considerable attention is devoted to state-wide and nation-wide organizations. Remedies proposed for confusion, duplication, overlapping and gaps in the voluntary health field include close coordination beginning at the federal level with an ultimate goal of a unified health program and wide coordination of the national health agencies. An over-all fund-raising and coordinating body similar to the National War Fund is suggested.

Government in Public Health. Harry S. Mustard, M.D. Studies of the New York Academy of Medicine, Committee on Medicine and the Changing Order. $1.50. pp. 219, 3 illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1945.

This book, one of an important series, was written to inform the leaders in the practice and teaching of medicine of the scope of public health as it has been and may become. It is a clear and unbiased record of that revolution which the knowledge of human biology has demanded in the functions and organization of a society dominated by partisan politics. No student or teacher of public health, the general field of medical administration or preventive medicine at the medical school or postgraduate level can afford to go without this book. "At present local governments choose whether or not they will organize effective local health service. The time has come to follow precedent and make the provision of effective local health service a requirement."

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DR. BAUER'S TRIP TO POLAND

Dr. Bauer was invited a little over a year ago to serve as a member of the American Red Cross mission to Poland. Delays in obtaining travel documents, visas and other official permits caused the mission to be put off until September.

Dr. Bauer and the other two members of the group visited all the schools of medicine and schools of nursing in the country, inspected a number

of municipal and provincial hospitals, health centers, refugee camps, tuberculosis hospitals, orphan asylums, old people's homes, etc. Getting back to Paris in late November, Dr. Bauer wrote a detailed report of his observations, and excerpts concerning public health follow:

".....We were the first contacts with the outside world they had had in six long years of most total isolation. How complete this isolation is was shown by the fact that practically all doctors, and even university professors, had never heard of DDT and penicillin."

"Although Poland has been one of the endemic centers of typhus fever, there were relatively few cases reported last autumn, and in the course of our visits of a large number of hospitals, we actually saw only a single case. However, in the middle of November it was reported that there was a sharp increase of typhus among the displaced persons arriving in Silesia from the West. Conditions for a large-scale epidemic among the repatriates are exceedingly favorable, and unless drastic measures are taken immediately an epidemic of alarming proportions may result."

"There is a very great shortage of drugs, surgical instruments, surgical dressings; hospital mattresses, blankets and linen; microscopes and X-ray equipment..... On our visits we saw toilet paper and old rags used as surgical dressing material, and old packing cases used for operating tables..... There are no anesthetics and most operations are carried out without anesthesia. Hospital clothing for patients, as well as gowns for doctors and uniforms for nurses are also totally lacking."

"There is at present very much venereal disease and the rate is increasing alarmingly as families become reunited. Unless immediate and drastic measures are taken, the results will be disastrous on the children born of infected parents..... Real solution would be to establish a penicillin manufacturing plant right in Poland, and practically saturate the whole population with penicillin. From the limited amount available, penicillin at present is used only in inadequate dosages for the treatment of gonorrhea and syphilis. This is a dangerous procedure in that it tends to develop penicillin resistant strains of gonococci and treponemata which are later going to be much more difficult to deal with.

"The next most serious medical problem is tuberculosis which is also increasing at an alarming rate, especially among the cave dwellers in the devastated area. According to the Ministry of Health, there are at present 1,200,000 reported cases of tuberculosis in Poland, which is about 5 per cent of the entire population. The incidence is greatest among children and young adults, and among them the death rate from this disease is very high. Not counting the two sanatoriums operated by the Polish Red Cross, there are only 5,570 hospital beds available for tuberculosis patients in the entire country.

"During the summer months there was a considerable amount of typhoid fever in Poland and more is expected next summer. In most of the cities sewage systems are damaged and water supplies polluted. Sanitary engineers lack labor, materials and funds to undertake the extensive repairs necessary."

"Much to our surprise we found plenty of food in Poland and no evidence of malnutrition except among persons just returning from western Germany. No foodstuff or farm products are rationed in Poland at present time. Everything is sold in open market and anyone who has the money can buy anything he wants."

"The greatest medical problem facing Poland at present time, however, is the shortage of medical personnel. Before the war there were 14,000 registered physicians, at present there are only 5,958, plus about 1,000 in the Army. No accurate figures were available as to the number of nurses left, but it was stated that the loss among them has been in proportion to that of the doctors. Many of the doctors left are rather old or have aged prematurely as a result of imprisonment and other hardships suffered during German occupation. No young physicians have graduated since the spring of 1939. During the five and half years of German occupation, all Universities and medical schools were closed and it will be at least another four years before new graduates will be receiving their doctors diploma.

"There are at present 7 medical schools in Poland which are located in Warsaw, Lublin, Lodz, Krakow, Poznan, Breslau and Danzig. This is actually more than Poland had before the war. She lost the Universities of Wilno and Lwow, but acquired those of Breslau and Danzig, and in addition established two entirely new ones in Lublin and Lodz. During the occupation about 50 per cent of the university professors were killed by the Germans. The remaining 50 per cent is obviously not enough to staff the universities functioning at present time.....

"The only medical school that may be considered as functioning more or less normally at present time is that in Krakow. The city suffered practically no war damage..... The Dean of the Medical School, Prof. Supniewski, is a first rate man and a former Rockefeller Foundation fellow..... The medical faculty of the University of Warsaw has also retained its old academic tradition and it still has many of its old professors. The Dean is the famous physiologist, Prof. Czibulski. At present there are over 500 students enrolled, but the medical school buildings suffered much damage from the war..... The medical school in Poznan also made a very good impression on us. The buildings there suffered a considerable damage but they are rapidly being repaired and the school is already open with a large number of students enrolled. The Dean is Prof. Kwapinski. There was a fine academic spirit and much enthusiasm among the faculty, but much help is needed.....

"The medical school in Danzig is housed in the buildings of the former German Medical Academy. Although the city of Danzig lies almost completely in ruins, the medical school buildings suffered relatively little damage.....there is an ambitious program laid out for the school with a good prospect for success. The Dean is Prof. Grzegorzewski who is young, brilliant, energetic and a former Rockefeller Foundation fellow.....

"The situation as regards nursing education is even more critical. At present there are only two nursing schools functioning in Poland each with about 200 students. .....These are the University School of Nursing at Krakow, with Miss Anna Rydel still Director, and the newly established School of Nursing of the Medical Academy at Danzig, of which Miss Jadwiga Romanowska is Director. Both.....are former IHD fellows."

Staff Notes

Dr. Charles R. Anderson reported to the IHD Laboratories for duty on August 18, after completing his accumulative leave. He and his family are living at the Coveleigh Club in Rye, New York.

Dr. Richmond K. Anderson spent several weeks in Mexico this summer conferring with Foundation staff and Mexican officials in regard to a possible cooperative nutrition project. He has now started his study leave at Hopkins. The Andersons are continuing to make their home in Rockville, Maryland.

Dr. and Mrs. Marshall C. Balfour reached New York on July 18. After some time spent in the New York office, they vacationed for a while in the Pocono Mountains and at Provincetown, Massachusetts. Their daughter, Marcia, enters the New York School of Social Work this fall, and Nina has a position with the United Nations. Dr. and Mrs. Balfour are now in Baltimore, and their address is Apartment 2B-Allston, Corner North Charles and 32nd Street. Dr. Balfour has begun his study leave at Hopkins. He attended the September 19 meeting of the scientific directors.

Dr. J. H. Bauer was in Brussels from July 10-12, and in Copenhagen from July 19-27 where he attended the International Microbiology Congress. In August, he visited the group in Sardinia. Mrs. Bauer and her mother plan to return to the United States in October, and to go to Montevideo, Uruguay, their former home, in November. Mrs. Bauer expects to return to the States early in the year to join Dr. Bauer who will be returning on accumulative leave.

Dr. Charles H. Best returned September 22 from his summer in Europe. He will report at the meeting of the scientific directors on October 31 on the work visited of particular interest to the I.H.D.

Miss Elizabeth W. Brackett was in Athens from July 1-4. From there she went to Crete and spent the period July 5-8 observing nursing methods on the Island. On July 9 she returned to Athens, leaving there the 10th by air for Paris. She visited Frankfurt, Weisbaden, Heidelberg and Stuttgart from July 22-26, returning to Paris the 26th.

Dr. and Mrs. John C. Bugher have bought a house at 125 Murray Avenue, Larchmont, New York. Mrs. Bugher moved in during August and is gradually getting settled there.

Dr. Delphine Clarke reviewed her activities in the Malaria Section of the I.H.D. Laboratories for the scientific directors at their meeting on September 19.

Dr. and Mrs. O. R. Causey expect to return on accumulative leave early in November.

Miss Janet D. Corwin was in Cawnpore, India, from July 2-4, in Lucknow, July 5, and in Calcutta from July 6-9. The 9th and 10th she was en route to Madras, and from Madras went to Vellore, spending the 11th to

14th in Vellore, returning to Madras where she remained from the 15th to the 19th. From the 19th to the 24th she was in Colombo, Ceylon, and from the 25th to 30th in Trivandrum, India. She was enroute to Bangalore the 30th.

Mr. Brian R. Dyer arrived in the U. S. June 30 on accumulative leave. After spending some time in New York, he went to California for his leave and will return to New York October 27. Shortly thereafter, he plans to sail for his new post in Cairo. It is probable that Mrs. Dyer will go to Egypt direct from China.

Dean Gordon M. Fair returned August 18 from his summer in Europe. He reported on his visits at the meeting of the scientific directors September 19.

Dr. John P. Fox has begun his study leave at the Columbia School of Public Health. On September 19, at the meeting of the scientific directors, he reviewed the activities of the Rickettsial Section of the New York Laboratories.

Dr. John B. Grant left New York by air August 23 for Europe. He was to have sailed on the SS AMERICA on August 20, but since the departure of this ship was delayed because of the strike, he flew. He returned from London, September 29. He will attend the meetings of the APHA in Atlantic City early in October.

Dr. Lewis W. Hackett visited Chile, Peru and Bolivia from August 31 to September 18, returning to Buenos Aires September 19. He expects to attend the budget estimate meeting of the scientific directors on October 31. Dr. Hackett and Dr. Soper were made honorary members of the Asociación Argentina de Higiene this summer.

Dr. Hackett has been appointed by Dr. Strode official representative of the IHD at the meeting of the Directing Council of the Pan American Sanitary Bureau in Buenos Aires on September 22, 1947.

Dr. Richard G. Hahn, his wife and son sailed August 8 on the SS MANDARIN to return to Lagos, Nigeria, West Africa, arriving there August 30.

Dr. Guy S. Hayes was assigned for the summer as director of the Obion-Lake District Department of Public Health in Union City, Tennessee. He and Mrs. Hayes will sail early in October from New York for Brazil on the SS MORMACISLE. Prior to his sailing, he will spend a short time working with Dr. Frobisher at Hopkins.

Dr. Rolla B. Hill was in Ciudad Trujillo from July 19-27; Haiti, from July 28-30; and in Jamaica from July 31 to August 8. He will attend the budget estimate meeting of the scientific directors on October 31, after which he expects to take some accumulative leave.

Miss Esther Mary Hirst was in Ica, Peru, from July 16-19, and in Quito, Ecuador, from August 5-21.

Dr. Thomas P. Hughes reached the U. S. July 30 from Rio de Janeiro on accumulative leave. He has been spending most of his leave in and around New York City, with a visit to Woods Hole, Massachusetts, during the summer. He plans to be in New Orleans most of October, and has a reservation from there for Rio de Janeiro, on October 31, on the DELNORTE. Dr. Hughes attended the meeting of the scientific directors on September 19.

Dr. and Mrs. John L. Hydrick and their children left Miami by plane September 11 to return to Lima, Peru, after spending leave in the U. S.

Dr. Harald N. Johnson reviewed his activities in the Malaria Section of the IHD Laboratories in New York at the meeting of the scientific directors on September 19.

Dr. J. Austin Kerr is returning to the U. S. for reassignment. Upon his departure, the direction of the eradication program in Sardinia will be assumed by Dr. John A. Logan.

Mr. F. W. Knipe transferred his headquarters from Rome to Cagliari, Sardinia, on June 18.

Dr. Charles N. Leach has been in the U. S. this summer on accumulative leave, most of the time having been spent at his home in Newfane, Vermont. He attended the meeting of the scientific directors September 19, and expects to go to Atlantic City early in October for the meetings of the APHA.

Mr. Estus H. Magoon moved his headquarters from Havana to Miami the end of July. On August 15 he began his accumulative leave.

Dr. Oliver R. McCoy spent several days in Helsinki, Finland, and in Stockholm, Sweden, in August.

Dr. William A. McIntosh is planning to take the remainder of his accumulative leave beginning about the middle of October, during which he and Mrs. McIntosh expect to take an automobile trip to California.

Miss Anna Noll, after visits in the South with Miss Varley, proceeded to Baltimore where she remained until September 18. On September 19, she attended the meeting of the scientific directors.

Dr. and Mrs. J. Harland Paul and their daughter, Heather, sailed from Galveston, Texas, the end of June, reaching Shanghai July 28. The end of August they left Shanghai for Taiwan (Formosa), which will be Dr. Paul's post.

Dr. George C. Payne visited Ann Arbor, Lansing and Detroit, Michigan, from August 13-15, and plans to attend the APHA meetings in Atlantic City in October.

Dr. and Mrs. Osler L. Peterson and their two children sailed September 9 from New York on the SATURNIA for Sardinia, where Dr. Peterson will be stationed.

Dr. Persis Putnam will attend the APHA meetings in Atlantic City, October 6 to 10.

Dr. Paul F. Russell's new address in Pelham Manor is 519 Manor Lane. He was present at the meeting of the scientific directors September 19.

Dr. and Mrs. Hugh H. Smith moved into their new house in Harrison, New York, the end of August. Their address there is Cricklewood Lane. From September 4 to 8, Dr. Smith visited Doctors Rickard and Worth in Tampa, Florida, and Dr. Boyd in Tallahassee. On the 9th and 10th he was in Princeton attending a second conference on local health units called by the APHA. September 29 and 30 he will spend in Durham, N. C., visiting the North Carolina College for Negroes with Mr. R. D. Calkins, head of the GEB, to investigate a proposal for aid to that college, and in Raleigh, N. C., to confer with Dr. Reynolds. He plans to attend the APHA meetings in Atlantic City in October.

Dr. F. L. Soper visited Brazil the end of August en route to the meeting of the Directing Council of the Pan American Sanitary Bureau in Buenos Aires on September 22, 1947.

Dr. George K. Strode will attend the APHA meetings in Atlantic City from October 6 to 10. Dr. Strode has been informed of his election by the Society of British Medical Officers of Health to their Honorary Fellowship. Dr. Thomas Parran and Dr. Harry Mustard have been similarly honored.

Dr. Richard M. Taylor accompanied Dr. Smith on his visit to Florida early in September, and also visited Georgia, in connection with his contemplated epidemiological studies on murine typhus. Dr. Taylor reviewed the work of the Virus Section of the N. Y. Laboratories at the meeting of the scientific directors on September 19.

In September, Dr. Taylor received word that he had been appointed to serve on the Yellow Fever Panel to be created by the Interim Commission of the World Health Organization.

Miss Mary Elizabeth Tennant, from the 1st of July till the 9th, was in New York City. The 10th and 11th of July she spent visiting the University of Pittsburgh in Pittsburgh and then spent a day in Cleveland, returning to New York City on the 15th, where she remained until the end of July. The 29th and 30th of July were spent in Detroit and the 31st in Ann Arbor, Michigan; August 1 Miss Tennant visited Battle Creek, and August 2 Tecumseh, Michigan; August 3 she was en route from Ann Arbor to Chicago, and from Chicago to Minneapolis on August 4; on the 5th she traveled from Minneapolis to Denver via Omaha, spending the 6th in Boulder, Colorado. The 7th and 8th of August she was in Denver, and on the 9th went to Cripple Creek, Colorado, where she began her vacation.

She will go to Atlantic City October 6 for the meetings of the APHA.

Dr. Max Theiler spoke on his activities in the Malaria Section of the IHD Laboratories in N. Y. at the meeting of the scientific directors on September 19.

Prior to Miss Margaret Varley's assignment to the field, a program of observation was arranged for her beginning June 9 at the University of Toronto School of Nursing where she attended the Institute being offered from June 9 to 21. From June 23 to July 3 she was at Yale University School of Nursing, and then proceeded to Baltimore for a program of observation with the Maryland State Health Department from July 7 to 15. From Baltimore, Miss Varley went to Washington, D. C., where she was joined by Miss Noll, who was beginning a similar period of observation before leaving on her first foreign assignment for the IHD. In Washington they visited the Veterans Administration, the U. S. Public Health Service, the Children's Bureau and the American Red Cross. Then they went to the Georgia State Health Department in Atlanta where they stayed from July 24 to 30, going on to Sheffield, Alabama, to observe the work of the Tennessee Valley Authority on July 31, and August 1 and 2. From the 4th of August to the 30th they visited Vanderbilt University School of Nursing, and then proceeded to Lansing, Michigan, on August 31, to visit the Michigan State Department of Health. They left Lansing the 6th of September, returning to New York via Detroit.

Since her return, Miss Varley has been in the New York office. She attended the meeting of the scientific directors on September 19. She will sail on the SS AMERICA October 8 for France, en route to Cairo, Egypt. She has been assigned to the Africa-Asia Minor Region until the latter part of 1948, when it is expected she will go to Paris to serve as nursing adviser in Europe.

Dr. A. J. Warren attended a meeting of the Tropical Diseases Study Section of the National Institute of Health in Washington, D. C., on September 29. He plans to leave the middle of October for visits to the Division's laboratories in Lagos, West Africa, and Entebbe, East Africa, and will probably be joined in Entebbe by Dr. Wilson. Dr. Mahaffy is also planning to visit East Africa, on behalf of the Colonial Office, and hopes to be there during Dr. Warren's visit.

Dr. R. B. Watson visited Nanking August 18 to 20, Peiping, August 28 to 31, and spent about a week in Tokyo early in September. The latter part of September he flew to Delhi, India, to consult with Miss Corwin in regard to future plans in view of the disturbed political situation. On his return to Shanghai, he will stop off for a few days in Manila.

Dr. C. W. Wells completed his leave September 18. On the 19th, he attended the meeting of the scientific directors, and on the 24th left for his new post in Tennessee, where he will serve in connection with the IHD tuberculosis cooperative project in Williamson County. Mrs. Wells is remaining in New Hampshire until Dr. Wells has secured a place to live in or near Franklin, Tennessee. The Wells' daughter, Eleanor, is teaching this year at Colby Junior College in New London, N. H.

Dr. Loring Whitman talked to the scientific directors on September 19 regarding his work in the Malaria Section of the N. Y. Laboratories.

Dr. D. Bruce Wilson visited Lebanon, Syria and Iran the end of the summer.

Dr. Wilson M. Wing sailed toward the end of August on the SS AMERICA for London. His wife and children are remaining here until he is able to find suitable living quarters for them.

BIRTHS

To Dr. and Mrs. Richmond K. Anderson a son, Royce Richmond, on July 16, 1947.

To Mr. and Mrs. Carleton F. Tenney, a son, Jonathon Carleton, on September 2, 1947. Mrs. Tenney is the former Peggie Warren, daughter of Dr. and Mrs. Andrew J. Warren. This is the Tenney's third child, and the Warren's fourth grandchild.

ENGAGEMENTS

Mr. and Mrs. William W. Keen Freeman of Salem, Massachusetts, have announced the engagement of their daughter, Mary deForest, to Daniel Franklin Milam, Jr., son of Dr. and Mrs. D. Franklin Milam.

MARRIAGES

Nina Jeannette Balfour to Mr. Alan Norman Hall on Friday, the fifth of September, 1947, in the Chapel of Riverside Church, New York City. Marcia Balfour served as her sister's only attendant. After the ceremony, a small reception for family and close friends was held at the home of Dr. and Mrs. A. J. Warren in Scarsdale, New York.

APPOINTMENTS TO IHD STAFF

Since the last NEWSLETTER, Miss Anna Mary Noll has been appointed a member of the staff of the Division, and her appointment became effective September 1, 1947. She received her B.A. and B.S. in Ed. in 1936 from Miami University, Ohio. In 1940, she received her Diploma from the New York Hospital School of Nursing, and in 1946, her M.A. - PHN from Teachers College, Columbia. During 1946-1947 she attended the University of Toronto School of Nursing under an IHD fellowship.

Miss Noll first served as a staff nurse with the East Harlem Nursing and Health Service from 1940-1941; as staff nurse with the Henry Street Visiting Nurse Service from 1941-1942; and from 1942-1946 with the U. S. Army Nurse Corps, serving one year of this period at Fort Devins, Massachusetts; four months in Australia; 18 months in New Guinea; and one year in the Philippines. She was demobilized as 1st Lieutenant.

It is planned to assign Miss Noll first to the European field for a period of orientation, and it is hoped that later she will be able to proceed to India where it was originally planned to assign her.

RESIGNATIONS FROM IHD STAFF

The resignation of Dr. Monroe D. Eaton became effective August 31, 1947. Dr. Eaton has accepted appointment as Associate Professor of Bacteriology and Immunology at the Harvard Medical School.

His appointment to the staff became effective July 1, 1937, and he was first assigned to the Division's Laboratories in New York City. There he worked originally on malaria, and later on influenza. In the fall of 1939, Dr. Eaton was assigned to work with the California State Board of Health in directing the influenza project which was being largely supported by the IHD. Later, in addition, he carried on research on infective hepatitis, and participated in the work of the California Virus Laboratory. During the war, he also served as a member of The Rockefeller Foundation Health Commission and of the Influenza Commission of the Army Board for the Investigation and Control of Influenza and Other Epidemic Diseases.

HONORS

On August 28, 1947, in the auditorium of the Ministry of Education and Health in Rio de Janeiro, Brazil, a bronze plaque was presented to The Rockefeller Foundation by the Sociedade Brasileira de Higiene. The presentation was made by Dr. Ernani Agricola, President of the Sociedade, to Dr. F. L. Soper on behalf of the Foundation. In connection with this presentation Dr. Agricola has written as follows:

"The Sociedade Brasileira de Higiene, in view of the great services rendered their country by The Rockefeller Foundation, decided to render homage to that philanthropic institution as a token of gratitude of the Brazilian authorities.

"We take advantage of your presence among us to request you to be the bearer of this bronze plaque, token of the gratitude of the doctors of this country to the Institution with which for many years you were so brilliantly and efficiently associated ....."

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Under date of August 26, His Majesty, King Farouk First, conferred decorations upon the following IHD and Health Commission staff who worked in the Gambiae Eradication Service in Egypt:

The Educational Order of the 2nd Degree to Dr. F. L. Soper; the Educational Order of the 3rd Degree to Doctors J. Austin Kerr and D. Bruce Wilson; and the Nile Order of the 5th Degree to Doctors Stuart S. Stevenson and Louis A. Riehl.

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On July 22, at a cocktail party at the British Embassy residence in Bogota, Colombia, the British Ambassador, Mr. Broadmead, presented Dr. John E. Elmendorf, Jr., with the badge of Honorary Officer of the Most

Excellent Order of the British Empire, on behalf of His Majesty, King George VI. The citation which accompanied the award was as follows:

COLONEL JOHN E. ELMENDORF
UNITED STATES ARMY

HONORARY OFFICER OF THE MILITARY DIVISION OF THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE

For almost three years, Colonel Elmendorf at the Army School of Malariology in Panama was directly responsible for the training of a number of R.A.M.C. and R.C.A.M.C. officers in practical methods of dealing with prevention of malaria.

Several R.A.M.C. officers from the North and South Caribbean Areas attended this course and spoke extremely highly of the excellent practical training they received.

The officers from both areas put the knowledge gained at these courses to very good advantage on their return to their stations, and in both areas proved able to effect a marked reduction in mosquite-borne diseases as direct result of the training that they received under Colonel Elmendorf.

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Dr. John A. Logan, at the Brazilian Embassy in Paris, on June 16, was awarded a Brazilian decoration for services rendered during his association with the I.I.A.A.

COPY

3 January 1947

MEMORANDUM

TO: Mr. F. Mayer, Deputy Director, Direct Purchase Branch

FROM: H. Witt

SUBJECT: Airplane Maintenance Supplies Against DP-MD-206

This will serve as your authorization to purchase against above number open-end requisition for Yugoslavia the aircraft maintenance supplies listed below:

1) Hydraulic Fluid Special No. 3586 (castor base) — 5 gallons

2) Hydraulic Fluid Special No. 3580 (mineral base) — 5 gallons

3) Cleveland Pneumatic High Pressure Hand Pumps (for struts) — 2 each

4) Chamois Skins 30" x 30" approx. — 12 each

5) Cotter Pins 3/32" x 1"

6) Parachutes for Pilot training 24' switlik or equal — 2 each

These items have approximate total value of $650.00 and are probably available from Air Associates Incorporated, Teeterboro, New Jersey.

Malaria Control in Crete

April to July 15th 1946

The object of this report is to describe malaria ... was organized in Crete. This, it is hoped, will ... om the point of view of its organization, because ... one program where UNRRA undertook complete respon... ...plied new methods other than the hereto traditio... ...employed by the Greek Government. Unfortunately ... the opportunity to complete this program for the ... in my report to Region K as well as in the re... ...on K.

... sanitary engineer, Region K-Crete was ... ...nize the work for the eradication of ... of Crete. To accomplish this he was ... ...ving:

... crystal form and 20% Velsicol solution as ... to be issued by UNRRA, HQ, sanitation ...

... mechanical and hand sprayers as required, ... issued by UNRRA.

... dollars alloted by GWR specially for this pro...

... assurance that for every one dollard spent by GWR ... government would spend two.

... oil and gasoline as required all invoices paya... ...Greek Government.

	15cwt trucks
	2.2/1 t. "
2	tank trucks
5	Harley motorcycles
6	jeeps

all loaned to the program by UNRRA.

g) One 220Hp Stearman PT-17 airplane equiped with generator for the disposal of 20% DDT Velsicol solution as thermal aerosol. This plane was made available by UNRRA. One pilot and two mechanics were trained by UNRRA and payed by the Government.

h) A staff of five trained engineers, two draftsmen and three drivers was made available by UNRRA.

i) One doctor malariologist and nine sanitary inspectors, trained by the School of Hygiene, Athens, made available by the Government

...istical Data

Crete is an island on the south Aegian, 34°-26° ...itude, 23°-26° longitude. It has an area of 8.378sq. kilo... ...ters (3280 sq. miles) Population (1928 census) 386.427 grou... ...into 547 communities.

Administratively the island is divided into four ... (Nomoi) from west to East: Chanea, Rethymnon, Iraklion, ... Lasithi. Each nome is sub-divided into sub-sections : Five for ... four for Rethymnon, seven for Iraklion, four for Lasithi. ... There are few swamps on Crete. There are also very ...ps. The largest one is the Messara plain, situated on ...n part of Iraklion nome. Appendix No7 shows all the ... There are two rivers in the Messara plain. Amidst

from those all the others are streams most of which dry up late in summer.

After a very careful survey from air and land the areas shown in black on the map (Appendix 7) were defined as treatable [illegible]

[illegible] very common phenomenon in Crete are large springs of [illegible] water near the shore line. There is one in Lassithi [illegible] Sisias, one five miles W of Iraklion, one five [illegible] Kepalis and one six miles W. of Chanea. [illegible] springs run down to the sea under a very small head, [illegible] areas. All of these swamps create a problem of [illegible] these springs are locally called ALMYROS meaning [illegible] water as it comes out of the spring is salty. [illegible] was to be based on a survey of spleen-indexes [illegible] by the 404 US Navy Epidemiological Team.

[illegible] in Crete in April 1946

[illegible] I arrived in Crete, April 4, 1946, the situation [illegible] follows:

[illegible] There were about 5,000 lbs of DDT available, 3,000 lbs [illegible] Iraklion storehouse and 2,000 in the Chanea storehouse.

[illegible] were some 200 sprayers made in Greece " Demetra" [illegible] sprayers were completely unsatisfactory for [illegible] work. The rubber hoses used on them were dissolving [illegible] with the oil, the taps were leaking, the handles [illegible] breaking because they were aluminum cast and the noz[illegible] were producing a very coarse spray.

c) The money both from [illegible] and Government was handed to the Govt malariologist. He was to keep accounts and report at the end of each month through the RSE to Col. Wright [illegible] money spent and estimated needs for the coming month.

d) The plane had just arrived and was ready to start operations.

e) The petrolium agents at Iraklion and Chanea were cooperating and had sufficient amounts of diesel oil and kerosene allocated to malaria control.

Organization

Iraklion nome is the central nome of the island. It is also the more malarious area. It was therefore decided that Iraklion town would constitute the base of operations for the whole island. The regional sanitary engineer and the Govt. malariologist were to have joined offices in Iraklion.

Iraklion has got a very good port and regular sea communication with Piraeus. The main warehouse for the island was also set up in Iraklion. Originally two mixing stations were set up. One in Chanea and one in Iraklion. Later a third station was organized in Rethymnon.

A new method was devised for mixing 5% solution of DDT in diesel oil and kerosene. The army provided us with german steel tanks. These tanks hold a capacity of 2,500 tons of water. An aluminum [illegible] cut in the form of a propeller was hung in the tank. It was driven either by an electric motor in Chanea or by a small gasoline engine in Iraklion and Rethymnon. The correct amounts of pure DDT were weighed and added to a full tank with oil then the propeller was started and it took about 40 minutes to have

it disolved. One 3 ton tanker was used for delivering solution to vital malaria control centres. The solution was mainly distributed in 54gal drums to the villages to be sprayed.

Labor

With the old method of controlling malaria the state or- ...on was sending a malaria inspector -sanitarian- to the ... treated. The inspector was authorized to hire labor ... to have the job done. The government approved scale ... so low that sacrifices had to be made on the qua- ... work in order to make work possible at all. ... to get the local population interested in the ... campaign and thus insure its success the following ... adopted:

... were written to all the presidents of Commu- ... the island of Crete explaining to them that there ... ample supply of DDT available on the island and with DDT ... could get rid of their flies, fleas, bed-bugs, mosquitoes, ... cockroaches etc. We were promising to supply the necessary ... 5% solution free of charge together with the necessary ... . One foreman would show them how to do the job. They ... supply the labor. Three laborers per 100 inhabitants. ... spraying and one for carrying the solution. Within the ... all of Crete 547 communities answered. They were ... have their villages sprayed, agreing to supply the labor

The larvae control side of the work was organized as ...

Each nome was subdivided into sub-area as shown in the -Appendix-5- Each sub-division comprises an area of 15-20 ... kilometers depending on the number of larvae breeding ... within it. One foreman was assigned to each subh area. ... foreman was given one 1:5000 map of his area. He explored ... area and denoted on it all the larvae breeding places. ... he divided these areas into 15 and made a schedule to spray one area per day thus completing one cycle in 15 days. Copies of these maps and schedules were kept at each nome office. The foreman was to spray himself using a hand flit gun holding one quart of 5% DDT solution. The solution was made up out of 20% Vesical solution. Each foreman was supplied with solution every 15 days.

To make this system effective, regular and numeral inspections were necessary. The govt. sanitary inspectors were given the task of making a first inspection. The engineer in charge of each nome also inspected. About 150 foremen were employed at the peak of the work.

Training the personnel

Four engineers were sent to Crete for the job. They were given instructions about the work and each one was assigned to one nome. Two govt. sanitary inspectors were assigned to work under each engineer.

Each engineer gave a training course in each nome. High school graduates were invited to attend. They were tought about the use and the properties of DDT as an insecticide, also elementary things about mosquitoes and larvae. They had demonstrations made to them in the field. Those who proved to be good were hired as foremen, either for residual spray or for larvae control. The residual spray foreman tought his labourers each time they moved into a community.

Work Accomplished

Organized work as described above did not start till early in May. Even then it would not have been too late had we had enough materials and equipment on hand. From April 1st to June 1st there was only 2.1/2 tons of pure DDT available and about twenty 54 gal of 20% solution.

Another difficulty was encountered with the spray- the Greek made " Demetra " sprayers on hand were proven to -eless. The hose was melting with the oil, the taps were the nozzles were using up too much solution. How- the middle of may we got good sprayers, "Hudson " type, and this difficulty was overcome.

Finally transportation was another limiting factor -ations. Each nome was given the use of two 15cwt one jeep. It should have had twice as many.Besides of the villages are approachable by road. The be reached on donkey, mule back or by sea.

The names and particulars of the villages sprayed given in Appendix No. 9. They constitute 40% of the whole

Most of this work was accomplished in June. Fifteen of pure DDT was usedduring the first 20 days of June. -one thousand homes were sprayed daily then. amount of 100% DDT used is 19 tons -April-June-

One airplane was used for spraying the swampy areas -vers. In Appendix No. 7 it is shown how the whole divided into areas. The plane was spraying, weather -g, on a regular schedule. The pilot was receiving flight from the Regional Sanitary Engineer for each flight. -ber of times the areas have been sprayed as well as the of spraying are indicated on the attached table -Appendix All areas sprayed by plane were checked 24 hours later in -r to ascertain the results.

Priority in spraying villages and area was given in -formity with the spleen index of the village as given by the US Navy Epidemiological Team. -Appendix No. 6-

In Appendix No. 10 all villages sprayed are marked in -ed and numbered according to the list. -Appendix 9-

All the villages with a spleen index above 5% have been sprayed.

Results.

Right from the start the results of DDT spraying were most gratifying. So strinking were the results that villagers were sending delegations to Iraklion to demand that their village be given priority, some offering to transport the materials at their own expense. In all cases the residual spraying foremen were given food and shelter free, by the communities.

In order to understand the importance of this job for the Greek village one must have lived in these villages. The houses are composed of two or three rooms, usually without any floor.The whole family, 5-6 members, live crowded in one room. The rooms are interconnected and rather as a rule one of the rooms is used as a stable. Fleas and bed-bugs are so many that for anybody not used to it, life is just impossible. When the first few villages had been sprayed and the results were testified, the rumor spread so fast that instead of propaganda as it was first intended we had to find a way of appeasing demand. However one form of propaganda was needed and used: Leaflets were dropped by plane on each village as it was being sprayed explaining the correct method of doing the job and asking the villagers to supervise and see that the crew did a good job, while it was at it. The feeling of responsibility towards the work was thus created among the villages who, after all, were the people primarily concerned.

Conclusion

The eradication of mosquitoes with the use of DDT from a well defined area such as Crete is quite possible, provided the money, materials, equipment and freedom of action are assured.

For Crete the work should be started in winter or [illegible] in March.

[illegible] is infinitely better, from all points of view, to [illegible] population itself interested in the work, than to try [illegible] independently.

The airplane although very effective, should not be [illegible] very much upon, because of the uncertainty of the weather conditions. Most of the time there was too strong a wind [illegible] the use of the airplane.

[signature]
R.S.E. UNRRA.

Analysis of expenses on malaria Control in Region "K"
April 1st to July 31st.

A. Total money spent	196.000.000	
B. Money spent on wages	163.000.000	
C. Money spent on various expenditures		33.000.000
D. Money spent on wages for		
residual spray		40.750.000
Money spent on wages of warehouse		
other personnel		25.000.000
Money spent on wages for the larvae		
control		97.250.000
Drachmas by UNR		74.180.085
Expenses by Government		121.669.162
Money owed by Government to UNR because of misidentification of bills		6.995.727

Evaluation

Cost of spraying houses 1000 drchm per house
Considering that it is estimated that the job was carried to completion, 300.000.000 drachmas more would be needed for the completion of the work in Crete.

ANRRA R.S.E.

MALARIA KONTROL • REGION "K"

SPRAYING OF SWAMPS BY AIRPLANE

	DISTRICTS	DATE OF SPRAYING				
1.	I. DISTRICTS OF HERAKLION	/				
1.	Almiros river	18.5.46	14.6.46	10.7.46		
2.	Gazi "	18.5.46	14.6.46			
3.	Viofyros "	20.5.46	14.6.46	17.6.46		
4.	Sklamianos "	20.5.46				
5.	Karteros "	17.5.46	15.6.46			
6.	Airfield Swamp	10.5.46	15.6.46			
7.	Estuary of Aposelemi river	10.5.46	15.6.46			
8.	Mallia Region	17.5.46	15.6.46			
9.						
10.						
11.						
12.						
13.						
	II. DISTRICT OF RETHYMNON					
1.	Estuary of Platane river	8.5.46	1.6.46			
2.	District of Arsanion Monastery	8.5.46				
3.	" " Scaleta					
4.	Margarillanos river					
	III. DISTRICT OF GEORGIOUPOLIS					
1.	Estuary of Krissanou river	6.6.46				
2.	Lake Kourna	6.6.46				
3.	Estuary of Mozela river	6.6.46				
4.	District of Vothra	6.6.46				
	IV DISTRICT OF CHANEA					
1.	District of Perivolia	5.6.46				
2.	" " Souda	8.6.46				
3.	River Kofliaris	8.6.46				
4.	" Mesopotamos	8.6.46				
5	Seashore of Vizolia	8.6.46				

	DISTRICTS	DATE OF SPRAYING			
	V. DISTRICT OF MALEME				
1.	Estuary of Typhlos river	7.6.46			
2.	Torenitis river	7.6.46			
3.	District of Modi	11.5.46	5.6.46		
4.	Platanias river (Ayia)	11.5.46	5.6.46		
5.	District of Kastelli	7.6.46			
6.	" " Kolymbari	7.6.46			
	VI. DISTRICT OF LOWER MESSARA				
1.	Estuary of plati river	18.5.46	18.6.46		
2.	District of Kokinos Pyrgos	18.5.46	18.6.46	28.6.46	3.7.46
3.	Yero Potamos	19.5.46	20.5.46		
	VII. DISTRICT OF HIGHER MESSARA				
1.	Anapodaris river	21.5.46	22.5.46	8.7.46	
	VIII. DISTRICT OF IERAPETRA. A. AG. NICOLAOS				
1.	Verondas river	16.5.46			
2.	Vothiri stream	16.5.46			
3.	District of Ierapetra	16.5.46			
4.	Stream along side road	16.5.46			
5.	District of Agios Nicolaos	10.5.46	23.5.46	17.6.46	
6.	" " Kato - Horio	16.5.46			
	IX. DISTRICT OF SITIA				
1.	Swamp of Sitia	13.6.46			
2.	Stomion river	13.6.46			
3.	Langadas	13.6.46			
4.	Four (4) Lakes of Zikos village				