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INDUSTRIAL ARTS FOR DISADVANTAGED YOUTH

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Industrial Arts
For Disadvantaged Youth

19 th Yearbook

American Council on Industrial Arts Teacher Education

1970

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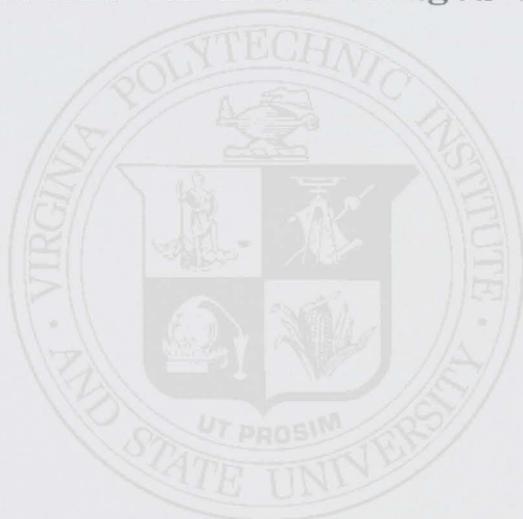
INDUSTRIAL ARTS FOR DISADVANTAGED YOUTH

An Analysis of the Individual, His Meaningful Adjustment
to Life and Society and the Function of Industrial Arts

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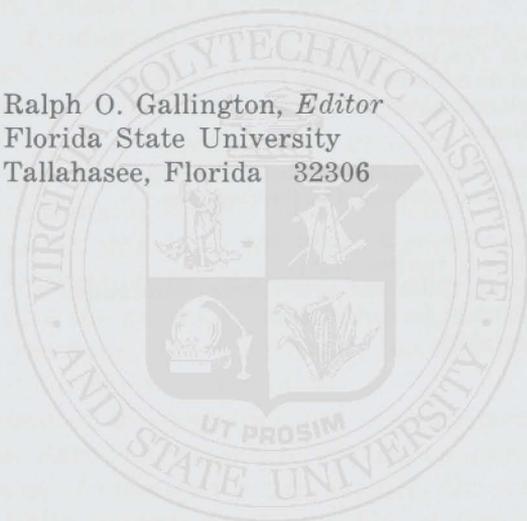
19 th Yearbook of the

AMERICAN COUNCIL ON INDUSTRIAL ARTS TEACHER EDUCATION

A Division of the American Industrial Arts Association
and the National Education Association

1970

Foreword

The Yearbook Committee and the Officers of the Council are pleased to present to the profession a long overdue book on the teaching of industrial arts for the disadvantaged youth. This topic has been discussed at numerous conventions, a myriad of articles have been written on the subject, and the authors wish to give credit for this rich background material. It is the hope of the Council that this book has brought together, under a single cover, the best thinking on this topic for your reference and use.

The editor of this work has been an active participant in the field of instruction for the disadvantaged and is eminently qualified to give the necessary leadership in developing the content of this yearbook. The authors he has selected are equally well qualified for their contribution.

The content of this yearbook has been written in three distinct sections. Part one consists of several chapters which point up the problems of inner-city youth, identify the school dropouts, and discuss which persons can be considered disadvantaged. The second part of the text considers the teacher of industrial arts for the disadvantaged, and describes the content of the industrial arts program. The final section of the text develops content units in the three major areas of the industrial establishment: the service industries, the manufacturing industries, and the construction industries.

Although the thrust of Yearbook 19 is aimed at industrial arts instruction for the disadvantaged, a general message is woven into the content sections of the text that suggests this might well be a program for the regular industrial arts student.

The Yearbook Committee and the Officers of the Council hope that each volume in the yearbook series is a thought-pro-

voking experience for the reader and the content does advance the profession of industrial arts education.

The ACIATE gratefully acknowledges the work of the editor, Ralph Gallington, and the chapter authors whose efforts and dedication have given the council members and the profession valuable information on this important concern of education, the teaching of industrial arts for the disadvantaged.

Once again the Council wishes to express publicly the sincere appreciation of the membership to the McKnight & McKnight Publishing Company for its contribution in underwriting the Yearbook program.

Frederick D. Kagy
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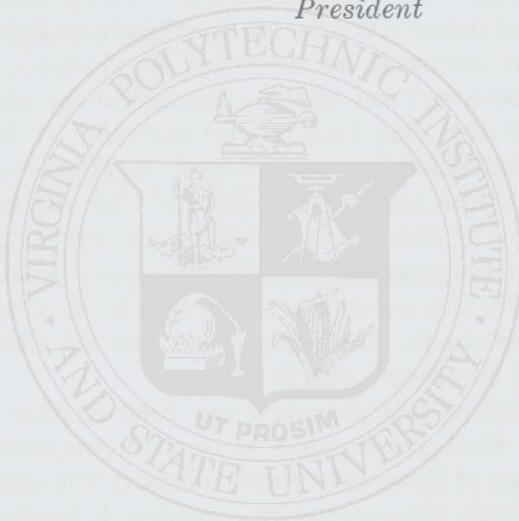
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* Out-of-print yearbooks can be obtained on microfilm and in Xerox copies. For information on price and delivery, write directly to University Microfilms Inc., 313 N. First Street, Ann Arbor, Michigan 48107.

Contents

Preface

Since the inception of Yearbook Nineteen some five years ago, many facets of our society have become concerned about disadvantaged youth. Within recent years almost every large city in our nation has had experimentations and/or demonstration projects conducted with its disadvantaged youth at various grade and age levels. Almost all such projects are new, having developed mainly as a result of the "war on poverty" program of the middle 1960's. During the last two years (1968 and 1969), much has been said about "occupational" and "pre-vocational" education for disadvantaged people.

With assistance from the National Defense Education Act and the Education Professions Development Act, several colleges and universities have conducted institutes to train teachers to cope more effectively with the problems of disadvantaged youth. Other funding, through the 1968 Amendments to the Vocational Education Act of 1963, has provided short-term training sessions for teachers of disadvantaged youth in inner cities and rural communities. To implement these institutes, programs of an "exploratory" nature in industrial education are being initiated throughout the nation. Many of these classes are being taught by industrial arts teachers.

In the above mentioned Amendments of 1968, particular reference is made to a type of "handicapped" person to be served. A minimum percentage of money is set aside for the training of the group "who have academic, socio-economic, or other handicaps that prevent them from succeeding in the regular vocational education program." This group is specified as being different from those "who are mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled or other health impaired . . ." This book deals with the former groups largely: those who have academic, socio-economic, or other handicaps not associated with the physical or mental condition.

Teacher institutes for all levels and types of disadvantaged youth have been held within the scholastic year 1968-69. This is quite gratifying to the authors who have benefited by the reports on these and other projects including research. Within the last few years, many free-lance authors have written about disadvantaged people everywhere, more particularly those in the inner city. Magazine articles on the subject have become numerous. Many people besides writers have given their impressions to the authors who in turn have reflected them in Yearbook Nineteen. All are grateful for the rapid growth in interest for disadvantaged peoples wherever dispersed. It makes for a good feeling, a feeling that the effort exerted here was one made in the right direction.

The editor wishes to thank the very able authors who researched their topics well and presented good manuscripts. He wishes to thank the members of his secretarial staff in particular. Without their understanding and loyalty, the project would have suffered greatly. The primary purpose of all concerned was to sensitize industrial arts teachers to an entirely new challenge and to introduce a neglected segment of our society who needs the industrial arts program so very desperately.
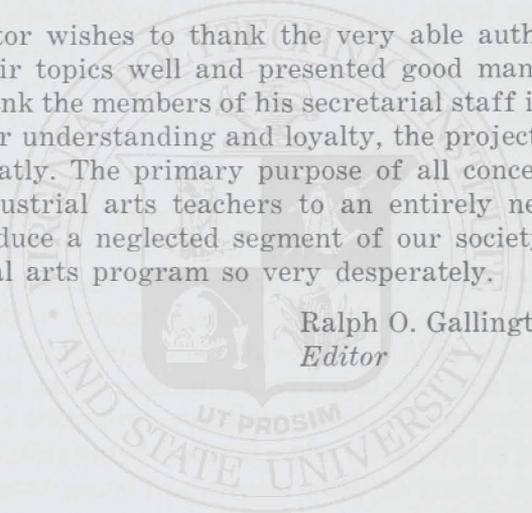
Ralph O. Gallington
Editor

The Disadvantaged Youth

RALPH O. GALLINGTON

Within recent years our society has become quite concerned about disadvantaged persons. Manuscripts have been published regarding their needs, identification and typical living conditions. There is a wide disparity among authorities as to the exact identification of a disadvantaged person. Acts of Congress have mentioned the disadvantaged specifically as beneficiaries of federal monies for education, employment and welfare. The Department of Health, Education and Welfare is integrally involved, with a large portion of its resources being addressed to the socially, economically and culturally deprived peoples in the United States. Public schools are receiving considerable federal monies for the vocational education of disadvantaged people at the post "formal-school" level.

Disadvantaged in Schools

Recently, researchers have discovered that among deprived children the commitment to a life of deprivation is often made at an early age. This finding gives impetus to a whole new line of action and thought which may change the structure of elementary education, possibly including the junior high school. What can be done for elementary school students to avoid their commitment or resignation to a life of deprivation? The answers to this question must be found. Correlative to this, a way must be found to develop within disadvantaged youth a positive commitment to, and an involvement in, career planning. Of course, these solutions must be worked out before grade retardation begins among deprived children of all ages and before all grade-level terminations set in. Many youth are grade-retarded due to causes other than low intelligence. Poor teaching, migration of families, poverty, indifference of parents are but a few of the causes. Studies mentioned later in this book have revealed that

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the level of intelligence of school dropouts generally approximates that of a normal distribution.

Perhaps one of the greatest deterrents to school interest is the curriculum and its disregard for students' needs, interests, aptitudes and capacities. John Dewey (3) emphasized the educational process as one which continually reconstructs life experiences. Most normal children with a keen perception soon discover that many exercises and drills required in the elementary school curriculum do not relate to their true life experiences. Such students soon become convinced that the elementary school (and probably all that follows) is not going to help them attain realistic goals. They often rationalize falsely that to drop out at the earliest legal age will favor them in attaining these goals at an earlier date. Consequently, their attitudes toward school activities and classroom assignments become passive, resulting in an early grade retardation for many. Grade retardation often begets further grade retardation due to the acceleration of a deterioration of interest. The overaged student cannot relate. Rather, he becomes a "marked" person for further grade retardation and as an early dropout. If the common-learnings curriculum could be more realistically reconstructed, consistent with real life experiences and student needs, grade retardation might be avoided for many. Education generally, and teachers particularly, must include more realistic teaching media and materials related to students' experiences and understanding.

Industrial arts and industrial media are particularly consistent at all levels of involvement, with present-day life experiences dominated as they are by science and invention. The interpretation of industry and technology is the primary purpose of industrial arts. Many interests are fulfilled and needs met in elementary education by industrial arts which reconstructs the life experiences at all societal levels in an industrially dominated life. Since disadvantaged youth often terminate their education at the elementary school levels, industrial arts as well as all other common learnings should be geared to present-day life experiences. These life experiences should include those of the students themselves as well as their out-of-school peers, idols and elders. All classes of people in the society (not just the affluent society) should be included when curricular materials are prepared. If all were geared to real-life experiences, the transition from school

to the work-a-day world might be delayed. And the transitions, when they came, would have had the articulation needed for a harmonious passage. Harmonious transitions from school to the world of work should provide for less of the hostility so frequently mentioned as prevalent among disadvantaged youth.

So far the discussion has dealt with elementary school grade-retarded children where extremely deprived inner city and rural children are particularly concerned. This is where retardation begins its degrading marks of identification. All deprived and disadvantaged children are not grade retarded, however. Many are quite permissive and obedient in the pursuit of their studies, finally completing grade school by moving to either the junior high school or senior high school, depending upon the administrative set-up of the local school system. Regardless of whether the curriculum is improved, some deprived children will eventually complete all grade levels of the common free public education in America, including the secondary school. This is not to say that they would have been served less ably by an improved curriculum. Rather, it is to indicate that some deprived children perform in the same manner as many middle-class children while in the elementary and high schools.

At the secondary school level even more improvement will be needed to halt the avalanche of dropouts occurring at about the tenth grade (near the student's sixteenth birthday). For students who will have progressed this far, much can be accomplished by selected and individual learning experiences in modern industrial technology. Again, the entire education program should be adjusted so that other subject-matter areas also make their contribution to the new curriculum by constant change of course content so as to reconstruct the changing life experiences of our time. The youth today often say, "tell it as it is." This is their plea. It reflects in modern language what John Dewey emphasized about education and life shortly after the turn of the century!

Why Disadvantaged?

The disadvantaged youth in our schools are disadvantaged for various reasons. One of the most prevalent generators of disadvantaged people is *Poverty*. This agent exists among all races in our society. It extends through all ethnic groups and religious

creeds. Restrictions on food, clothing and healthful living conditions make for other types of deprivations. Although many disadvantaged people do not know how to spend money wisely, education would probably correct this weakness over a period of time. Hunger, discomfort, and unwholesome living are strong deterrents to learning. Poverty is one of the most basic reasons why we have disadvantaged people in our society.

The *size of the family* partially determines the extent of financial need. Among very large families one may find considerable deprivation, grade retardation and school absenteeism. Maturation among large families is accelerated and creates a need for more adult teaching methods for deprived children. Although deprived children generally mature much faster than children of affluent families, among large poor families this is especially true. The breadwinner for a large family might make a salary sufficient to support a smaller family in comfortable surroundings. Due to spreading his earnings so thinly, his children are often grossly deprived by minimum standards. Poverty is prevalent among all sized families but it is quite noticeable in extra large families.

Migration, especially from the rural areas to large metropolitan areas, has generated much undue poverty and many disadvantaged people. Many basically frugal country folks move to cities because of the seemingly large wage differential. Upon locating in the inner city they find the cost of living far offsets the wage differences and instead of improving their financial status they have actually degraded it. Continuing to live in this situation causes family disadvantages to multiply at an accelerated rate. Migrant families, which earn fairly high salaries when they work, are often deprived of many cultural and social advantages regardless of the need for money. Their children seldom set down social roots and often become grade retarded because of entering and withdrawing so often from various school systems.

Parents' education and educational attitude is often a disadvantage or advantage which prevails through several generations. A parent wants for his children a better education than he himself received. In some cases, however, he regards a few grades beyond that which he received as sufficient. Parental apathy has a significant negative effect on a child's attitude toward continu-

ing in school. A father or the head of a deprived family may have an attitudinal influence which may reflect through several generations of his descendents. The *occupation of the parent(s)* is a factor in determining whether children in our schools are disadvantaged.

The *marital status of parents* often determines whether their children become classed as disadvantaged youth in our schools. In many cases of disadvantaged youth from broken families, poverty is not a factor. While the element of poverty may not be a problem, neglectful, disinterested and feuding parents cause much anxiety and insecurity in their children. The children in turn have disadvantages in their relationship with the school. To them school seems of secondary importance.

Many children are born of parents whose occupations cause them to be located in areas which in themselves are disadvantaged areas. Some are born into racial groups which have suffered through countless years of rejection and deprivation. The *accident of birth* is basic to many of them.

All of the above seven "generators" are quite basic. There are other related generators of disadvantaged youth, but most have their basic roots in (1) poverty, (2) size of family, (3) migration, (4) parents' education, (5) parents' occupational class, (6) parents' marital status and (7) accident of birth. Almost any one of these factors could be named in a specific case, but generally several are applicable.

How Do Disadvantaged Youth Behave?

While this subtitle infers that all disadvantaged youth behave in the same manner, such an assumption would be far from the truth. Many common manifestations have been observed more prevalently among these groups than among the so-called "advantaged" groups. However, it must be understood that poverty, for example, would not necessarily breed manifestations such as follow, nor should any one of the other generators necessarily have been present in cases where certain of these manifestations are observed. Another inference here is that the advantaged groups have few or none of the behavioristic tendencies of the disadvantaged. Once more, it must be made clear that many behavioristic tendencies of the disadvantaged are also conspicuous at times among advantaged groups. Regardless, much has

been said about the behavior of deprived and disadvantaged youth which needs to be presented here.

Withdrawal Tendencies

Many children of the deprived and disadvantaged are psychologically affected. Often undernourished, poorly clothed and in need of medicine and dental work, these children feel quite inferior to others. The withdrawal of a child could be to himself or to his equals in deprivation. The withdrawal is often accelerated by malnutrition. Schorr (8) points out that fatigue, sleeplessness, inability to concentrate and the lack of ambition are often due to lack of the quality and quantity of food needed for well-being. Further, crowded living and inadequate housing in deprived areas leads to loneliness and to mental problems or excessive and inappropriate stimulations. The withdrawal to one's own equals often leads to unwholesome stimulations and gratifications. The withdrawal tendency therefore, is of two types: (1) withdrawal to oneself, and (2) withdrawal to a cognitive group or "gang" to pursue temporary but immediate satisfactions.

Poor Achievement

Children from disadvantaged families are likely to be low achievers. Usually they score lower than a normal group. Studies indicate that deprived individuals have not developed their intelligence potential. Deprivation and the disadvantages associated therewith are deterrents to one developing his innate potentials which intelligence tests measure. Chapter Four deals more particularly with the needs of disadvantaged youth. Meeting the social and economic needs of these people will enable them to achieve more because meeting basic needs will allow for development of inborn potentials heretofore overlooked. Retarded achievement and grade retardation due to an undeveloped potential has had a great deal to do with the disadvantaged youth often being overaged among his classmates.

Resentment of Authority

Constant rejection and unkind treatment from elders at an early age has alienated many disadvantaged youth and created a tremendous gap in communication between themselves and their elders. This is especially true in the inner city. They have seen older persons punish youngsters and exploit them unmerci-

fully. Children and youth have been forced to gang together in order to protect themselves against those who would mistreat them. The authority they have met first in the slums was older people and stronger young adults. The resentment of this type of authority (which exercises cruelty) has led to a resentment of all authority and cruelty except that of their own neighborhood gangs. School authority, teachers and policemen all have become classified as their enemies. All persons in authority become exemplary of a society which has rejected them.

Loitering

Lack of a place to relax, sleep and study outside of school hours has driven many inner city slum children into the streets, alleys and vacant buildings to waste time. Being so completely idle most of the time has caused many to become the easy prey of petty criminals. Seeing no future in a life of respectability, their self-concept becomes diminished day by day until one day certain individuals begin to picture themselves more glamourously as associates of some local free-spending, criminal-type person. Many become involved in disrespectable activities, often due to exploitation. Some end up with juvenile police records.

Rejection of School

Schools are institutions of our society and society seems to reject disadvantaged youth. Hence, these youth tend to reject the school. When one speaks broadly of the school rejection, one includes more than a rejection of authority mentioned above. One includes the rejection of subject matter being taught. Inequities among children are made obvious in the classrooms, laboratories, shops, gymnasia and on the playgrounds. The disadvantaged student resents these inequities. He cannot rationalize his plight; he cannot resolve his own frustrations; he can only reject the school and everything it stands for.

Doubtless there are numerous reasons why disadvantaged youth reject school. The most often mentioned reason is that schools do not teach things which are related to disadvantaged living. The lessons taught and the assignments given are very unrealistic to disadvantaged youth with their limited horizons. The learning experiences are geared to the middle class society which is not understood by deprived youngsters. Among these two social classes of students vocabularies differ; familiar objects

in their neighborhoods are very dissimilar; family living and the homes cannot be considered remotely similar; and most important of all, the experiences of the two classes have extremes of unlikenesses. In the teaching situation the content and learning experiences are geared to the middle class group. Disadvantaged youth cannot relate to the instructional media or the materials used.

Delinquent Behavior

All delinquency may not be criminal behavior, but some must be recognized as such. The word "delinquent" includes serious offenses against society as well as a serious failure in one's responsibilities in his assigned duties. Burglarizing, for example, is in an entirely different class than petty thievery from an employer while in the line of duty. Delinquent tendencies begin to appear long before the actual fact. Many very deprived children are tempted frequently and show considerable character by refraining from wrong doing. Delinquency has been recognized as prevalent among disadvantaged youth; however, it may be less prevalent than the other behavior manifestations discussed above.

In summary, the things which characterize the disadvantaged students' behavior are: (1) withdrawal tendencies, (2) poor achievement, (3) resentment of authority, (4) loitering, (5) rejection of school and (6) delinquency. It seems a pity that the indigenous values of the disadvantaged communities have not been recognized as a source of instruction materials and media in our inner city schools. This would also apply to disadvantaged groups in rural groups and isolated mountainous groups of disadvantaged people.

The identifications set forth in this chapter should give one a better understanding of the probable plight of disadvantaged youth and the remedial practices for improving their plight. The fate of these youth will be determined by painstaking efforts given to a revision of subject matter, instruction areas, media and methods.

The Forces

A disadvantaged youth of today is torn between several gravitational forces which are at work attracting him away from his present "orbit." The school is very feebly pulling at this

youth, but the force is very unimpressive and it is not strong. Conversely, it would appear that some schools and teachers actually try to repel rather than attract the deprived and slow-learning student. With the authority exercised by truant officers the pull is rather strong and forceful until the legal age for school leaving is reached by the student. The force to keep the student in school is more negative than positive. He rejects the type of force which requires his attendance because of "legal" justifications. The attraction of the school itself would be a very effective force if it were operating well. This force would draw the student to it because of its interesting and motivating program. If it were operating well it would have relative experiences which would bring his life into direct relationship to the learning experiences at school. The school to be an effective force in the disadvantaged youth's life must be a more positive one than it has been before.

The family is a force of attraction or a repellent to the disadvantaged youth, generally a repellent. In instances where the family has a wholesome gravitational pull it will have come as a result of stability among its members. A strong positive paternal or maternal influence will enhance this force. The force will become a positive one only if a feeling of comfort and security exists in the home and if the parental influence is accompanied by a strong parental love and devotion. The family attraction, if wholesome and attractive, and the school climate, if positive and rewarding, would probably influence the disadvantaged youth into pulling himself out of his state of deprivation. His attitudes; his emotional, intellectual and personality development; and his self-image in relationship to others would overcome most of the causes for his disadvantaged situation, allowing him to transcend above it. A widespread influence of such a combination of school and home might well create a whole new image among disadvantaged youth and their future offspring. The disadvantaged category would then no longer apply.

Other forces are pulling at the deprived youth in a less direct way. The neighborhood has various attractions, some good and some evil. These forces include the churches, social organizations, political leaders, gangs, types of housing and the like. All either repel or attract youth. Community centers, where they exist, generally allow for wholesome grass root influences

to develop. Charitable organizations and people have made limited contributions to these centers, both in time and money. Inter-relationships between neighborhoods or gangs within an area exert force on disadvantaged youth. Welfare agencies, health and medical centers have their influence. As mentioned earlier the force of poverty is one of the greatest of all. Good food, adequate clothing and a safe comfortable home are the deprived items observed among most disadvantaged youth. These should be the first deficiencies to correct. The neglect of wholesome school, family and "other" forces would leave many causes for deprivation not associated with poverty.

The "concentric" forces which "pull" at the youth of today require that youth constantly make and are faced with decisions, many of which they put off as long as they can. This procrastination is good in ways. It allows the wholesome forces to have a fair chance to do their good work. Maybe there is hope that schools in particular can organize to offer attractive programs which relate to students' needs. Perhaps the schools can serve to integrate many wholesome forces to assist youth to pull themselves into an orbit of respectibility in a most fulfilling and rewarding way. Perhaps the delay in decision making among youth will allow for some improvement of effectiveness of the forces for good.

Other Related Factors

Generally, this yearbook deals with disadvantaged youth who otherwise have the normal native endowments. It would be difficult, however, to specify what these are. The "normal" endowments one has at birth should include normal intelligence which varies according to a normal distribution. This normality would exclude those who are severely handicapped physically, uneducable or extremely retarded mentally. The primary purpose of this yearbook is to address the problem of disadvantaged youth—deprived mostly because of failures of our society to make allowances for their normal growth, education, healthful living and cultural and intellectual development. Normal opportunities have been denied these people; opportunities for normal development have been their greatest deprivation.

The term "disadvantaged youth" is often used to designate other handicaps. For the purpose of recognizing some "other"

disadvantages and some of their causes, the following paragraphs present some relationships between "other" disadvantages and those with which this yearbook is primarily concerned.

Physical handicaps are of several different types and severity. These handicaps deal with such problems as the loss of hearing, speech, eyesight and physical members of the human body. All such handicaps may be considered deterrents to learning. The loss of one or more limbs provides complicated problems in education, especially where these members of the body are involved with skills and learning. Disease may cause damage to or a removal of some rather essential organ. Although diabetes is a condition often associated with adults, or with the aging, children are also affected by this disease. Many physical handicaps are innate and may have very few apparent marks of identification. Where these handicaps are not visible to the teacher, extreme damage could be done. Among children there is a wide spectrum of physical handicaps which should be detected and treated as soon as possible. Heart disease, asthma, epilepsy, arthritis, rheumatic fever, migraine headaches and ulcerous conditions are a few.

Mental handicaps may not be manifested and in turn may not be detected by the teacher. Insecurity and fear are often found among disadvantaged youth, especially at an early age. Where other emotional disturbances are present, mental anxieties and characteristics of a more serious nature may develop with the maturation of a child. All withdrawal tendencies are not the result of mental disturbances, but certain types are. Any psychotic disorder which causes withdrawal usually becomes apparent when the patient suffers a loss of contact with his environment. Also, he becomes identifiable when he has a disintegration of his personality. The withdrawal tendency of a person should be checked early to determine whether there is, or might be a mental problem involved. In some cases there may be schizophrenic tendencies or a schizophrenic temperament present within the bounds of normalcy. This is very difficult to observe and identify. Any irregularities observed in a child should cause him to be referred to a person or persons prepared to deal with him professionally. And, industrial arts teachers of disadvantaged youth should be taught also to look for positive indications. All children are subjected to displays of fear, hope,

anxiety, doubts, jealousy and anger. Some of these displays are observed among their elders under the influence of intoxicants or drugs. Such children themselves are suspect when it comes to intoxicants and drugs, but imitation is often a manifestation not to be confused with mental disturbances. Looking for indications of mental disturbances should be understood. Even drugs have been identified as producers of such disturbances.

Personal acts may cause great social and cultural deprivation. Early pregnancy, marriage, parenthood and divorce cause young people to become involved with untimely duties and responsibilities. Their attention is demanded whether they are ready or not. Drug addiction is generally self imposed or willfully accepted. The resultant physical, mental and financial handicaps are geometrically expanded as one accepts the consequences of drug addiction. Diseases, particularly venereal diseases, are unintentionaly contracted by antisocial personal actions. A misdemeanor, or worse yet a felony, will cause a young person disadvantages for the rest of his life. A "record" is something which our society is trying to mitigate, especially where a misdemeanor or felony was committed at an early age. Regardless, a court record is a great disadvantage to a person who has one. Records of poor school behavior and poor school grades are handicaps hard to overcome in later life. This is a pity in instances where the student involved could have done much better, or where he deliberately tried to make a poor showing.

Changing technology has displaced people and caused frustrating experiences in families. Standards of living have been lowered through unemployment or extra costs due to employment changes.

Home and family changes occur due to the death of a parent or other breadwinner, an extreme financial or material disaster, hospital bills or extremely high medical bills due to a prolonged illness.

Doubtless, one could add other factors to the list, or expand those given. There seems to be a multiplicity of handicaps among disadvantaged youth. It should be recognized that several forms of deprivations could be interrelated and present in any one

client. A complete record of all handicaps in each individual should be compiled in his individual inventory file.

A word of warning should be given to those who would make diagnoses. This should be left to the experts; however, industrial arts teachers should be required to do field work while taking instruction dealing with the abnormal child and special education. More about this will be presented in Chapter Four.

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School Dropouts

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The future of any country which is dependent on the will and wisdom of its citizens is damaged, and irreparably damaged, whenever any of its children is not educated to the fullest extent of his capacity, from grade school through graduate school. Today an estimated four out of every ten students in the fifth grade will not even finish high school—and that is a waste we cannot afford. (6)

—John F. Kennedy
January 14, 1963

The school dropout problem is by no means a new one. America has been confronted with early school leavers and dropouts since 1636 when the first Latin Grammar School was established in New England.

It seems axiomatic that whenever teachers and pupils have gathered together in formally constituted schools, there have always been those who, for any one of a number of reasons, would not complete their schooling. While the holding power of the public schools has continually increased over the past 300 years, educators during this same period have eyed the dropout problem with increased concern.

President John F. Kennedy was not the first high official in our land to express publicly extreme concern about the dropout problem. This problem was aired in Massachusetts in 1906 with the report of the Douglas Commission. The so-called "Douglas Commission" was authorized by the Massachusetts legislature in 1905 to study the needs being met by education institutions in the state and to investigate "what new forms of educational effort may be advisable." The conclusions reached by this body are listed as follows: (9: 44)

1. In regard to children who leave school for employment at age 14 and/or 15, the first three or four years are practically wasted years so far as the actual productive value of the child is concerned or as far as

increasing his industrial or productive efficiency is concerned. Employments which they may enter are not educative in any sense.

2. These children, many of whom leave school voluntarily at the completion of the seventh grade, would find further training of a practical character attractive and a possibility if it prepared for the industries. Any educational plan to increase the child's productive efficiency must consider the child of fourteen.

3. Children who continue in any well-organized school until sixteen or eighteen, especially if they complete a high-school course, are able to enter upon employments of a higher grade, usually in mercantile pursuits. They are able, by reason of greater maturity and better mental training, to learn the technique of their employment in a shorter time. But they are wholly lacking in manual skill and in what we call industrial intelligence. For the purpose of training for efficiency in productive employments, the added years spent in school are to a considerable extent lost years.

4. This condition (the lack of agencies for training) tends to increase the cost of production, to limit the output and to lower the grade in quality. Industries with employees recruited as in paragraph 3 cannot long compete with similar industries recruiting technically trained men. In the long run, that industry, wherever it is located, which combines general intelligence, the broadest technical knowledge and the highest technical skill, commands the markets of the world.

5. The industries of Massachusetts need—in addition to the general intelligence furnished by the public school system and the skill gained in the narrow fields of subdivided labor—a broader training in the principles of the trades. It needs a finer culture in taste as applied to workmanship and design. Whatever may be the cost of such training, failure to furnish it would in the end be more costly.

6. The state needs a wider diffusion of industrial intelligence as a foundation for the highest technical success. This can only be acquired in connection with the general system of education into which it should enter as an integral part from the beginning.

7. The investigation has shown the increasing necessity for woman to enter the industrial world for self-support. She should be prepared to earn a living wage. The attempt should be made to fit her so that she can and will enter those industries which are most closely allied to the home.

At the turn of this century the legislature of Massachusetts was concerned about school dropouts. Governor Douglas had been previously advised that schools were too literary and not concerned with the relationship of schools to real life experiences and to the society in which the youth were already involved. The first two of the above conclusions dealt primarily with the grade school (and early high school) dropout. This is about the same group of which President Kennedy spoke.

The Commission among other things recommended that the elementary school curriculum be modified to include "industrial education" which was designated as "agriculture, mechanical and domestic arts." Furthermore, it was recommended that the modification place this practical education on a high "cultural" level and that the practical instruction be highly consistent with industrial practices (9: 20).

Another recent President of the United States in his message (5) to the Congress stated that:

In our 15 largest cities, 60 percent of 10th grade students from poverty neighborhoods drop out before finishing high school. The cost of this neglect runs high—both for the youth and the Nation.
—Lyndon B. Johnson
January 12, 1965

These two very recent presidents of the United States were echoing the reports of many in our society who had observed the negative effects that school dropouts were having on our economy. They were sensitive to the relationships existing among the school dropouts and the high rate of youth unemployment, the rising rate of youth delinquency and crime, the increasing number of welfare families and the riots in the deprived areas especially in the large cities. Both presidents publicly expressed the growing concern which was being felt by governors, congressmen, educators, social workers and special advisory groups at local, state and national levels. These dedicated public servants had been voicing for several years their assessment of this Great American Tragedy—the school dropout.

The Situation

In this great country of ours we have developed one of the strongest and longest-lasting forms of democratic government the world has ever witnessed. We have built the mightiest industrial empire ever created on this earth. Truly, America is a giant industrial democracy. Our industrial might has given us one of the highest standards of living the world has ever seen. The typical American placidly accepts the products of our industrial democracy as "necessities" in today's living; but these same things were not available even to the richest king of a bygone era. Today we take for granted automobiles and airplanes,

telephones and colored television, dishwashers, vacuum cleaners, newspapers and magazines, tape recorders, electric lights and a host of other labor-saving and pleasure-giving devices. Yet all of the riches in a king's counting house could not have purchased any of these in earlier times. Today's man-in-the-street is even blasé about scientific breakthroughs, such as live world-wide television coverage via satellites, moon landings, deep space probes and the like. Americans have also taken giant steps forward in scientific medical research. Some diseases, previously fatal to large segments of the population, no longer threaten our people; others are slowly yielding to medical advances. Our agricultural know-how annually overfills our larders so that we have surpluses to feed other peoples of the world. Our educational and social welfare programs for all our people have increased in both breadth and depth. In 1966-67 America spent about 50 billion dollars on education, most of which was for public elementary and secondary schooling.

Despite such tremendous forward thrusts on all fronts and in all ways of human endeavor, America still has many serious unsolved problems. One of these problems of growing national anxiety is the widening gap between the disadvantaged people. This widening gap is enhanced by the increasing frustrations of the disadvantaged in coping with life and their apparent disassociation with school because it seems to offer no solution to their problems. Hence, there is a considerable number of school dropouts among the disadvantaged in America. Nearly three-quarters of a million young people continue to drop out of school each year. Another way to express it is: approximately one student out of every three now in the fifth grade (1969) will probably drop out of school before finishing high school. If the current rate is not abated, more than seven million youth will drop out of school in the next decade. This is in spite of the fact that the holding power of our schools is at its highest peak. The school dropout problem is a Great American Tragedy and a paradox as well, because it is continuing at an extremely high rate in spite of the fact that in recent years education has begun to do something about it.

Actually the percentage of school dropouts is remaining rather constant at the present time. The unfortunate situation is that dropouts among the disadvantaged seem to be on the

increase. The population explosion has caused a great increase in prospective dropouts. Nearly 50 million students or approximately one-fourth of all Americans are in the nation's classrooms. High school graduation and attendance are at all-time highs. Attendance has grown eighteen-fold since the turn of the century, which is six times as fast as the population has grown. And more students are completing high school today than ever before.

Figures now show that the school dropout rate has actually steadily decreased from 94 percent in 1900 to something under 33 percent in 1969. Indications are that the holding power of the schools may continue to improve although it is feared that the situation is becoming static. Even if retention does improve, we still face today, and will face for some time to come, a very serious educational and social problem among tremendous numbers of disadvantaged youth. While the holding power of the schools, percentage wise, has undoubtedly improved over the years, there is a continued increase in numbers of dropouts due to the increase in population. This is giving legislators, teachers, welfare workers and others cause for grave concern. Conditions are often especially bad in large cities, particularly where minority groups exist in ghetto areas. Dropout figures vary from region to region and from city to city across our nation. A recent report for the state of Pennsylvania revealed that in one year alone (1966-67 school year), there were 23,613 dropouts 16 and 17 years old and most of these could not find work. Current estimates place the nationwide school dropout figure at 734,000 pupils annually, with an estimated total exceeding seven million dropouts for the decade 1960-70.

There is mounting evidence that the school dropout segment of our population is closely related to other social maladies. In this connection President Kennedy (7) stated that:

Ignorance and illiteracy, unskilled workers and school dropouts—these and other failures of our education system breed failures in our social and economic system: delinquency, unemployment, chronic dependence, a waste of human resources, a loss of productive power and purchasing power and an increase in tax-supported benefits. The loss of only one year's income due to unemployment is more than the total cost of twelve years of education through high school. Failure to improve educational performance is thus not only poor social policy, it is poor economics.

—John F. Kennedy
January 29, 1963

The Bureau of Labor Statistics notes that while dropouts (elementary and high school) constitute a shrinking percentage of youth in the labor force, nevertheless, as a group, dropouts experience greater joblessness and are found in fewer white collar jobs than high school graduates. During the past decade jobs filled by high school graduates rose by 40 percent, but jobs for those with less schooling decreased by nearly ten percent. Unemployment for male dropouts is three to four times higher than for high school graduates. The best a school dropout can hope for is to secure some type of unskilled work or "blind-alley" job. But unskilled jobs as a whole are rapidly disappearing from industry due to new technology and to new and improved production methods including automation. It is estimated that during the next ten years only five workers out of 100 will be engaged in unskilled jobs. In short, the out-of-school youth, the dropout, faces a diminishing market or demand for what he has to offer—unskilled services. This is one reason why the rate of youth unemployment is so high and why this figure is several times higher than the average unemployment rate for the nation. The unemployment of young people with an eighth grade education or less is four times the national average. Dropouts doing unskilled work are also the first to be laid off in any job cutback or personnel reduction plan.

Although the proportion of out-of-school youth in the labor force is becoming smaller, the problem is in no way reduced. The population growth means that almost four million youth annually reach the age of eighteen; this is about a million more than reached this age five years ago (1964). Thus, while proportions or percentages are dropping, the number of cases involved is still of tremendous magnitude.

Another grave social problem of the day is the disturbances among socially and economically deprived groups throughout the land, especially in the larger cities. It has been found that youth who are both out-of-school and unemployed constitute a large proportion of the rioters and participants. Obviously related to this problem is the growing rate of crime and delinquency among out-of-school, unemployed youth in America. The out-of-school unemployed youth problems of the large cities have increased over the past few decades with the trend in migration from rural areas to the more densely populated areas. One

result of this has been a growing number of welfare families in large cities which has, in turn, placed an increased burden on the taxpayers to meet increased costs of delinquency and public assistance. Uneducated and apathetic parents have had their affect on the increased dropout rate among this group.

Many other social factors not cited are operating either directly or indirectly to increase the number of school dropouts. Some have merely tended to aggravate the effects of dropouts on society. Almost all of the *causes* of poverty and the *characteristics* and peculiarities of disadvantaged people make their contribution to an early withdrawal from formal education of the children of these people.

There seems to be no simple solution to the school dropout problem. It is a deep-seated, multi-faceted problem which is a reflection of our times. It cannot be denied that today America faces a number of grave crises which, in general terms, involve a deterioration in the quality of our lives. The school dropout problem is a contributory factor to this deterioration. If the numbers of dropouts from school could be reduced substantially, certainly this should tend to have an ameliorating effect on certain other social problems which have been noted briefly herein; namely, youth unemployment, inner city disturbances, crime and delinquency. As President Johnson (5) once noted:

> Among the unfinished tasks of our Nation, the improvement of education deserves first priority. It is our primary weapon in the war on poverty and the principal tool for building a Great Society.

Within the last decade it has been observed that children begin to show dropout tendencies at an early age. It is ironic that the tendencies appear to a greater degree among the so-called "disadvantaged" groups (with more cultural needs for education) than among the more affluent groups. Many of the potential dropouts are found to be children of parents who themselves dropped out of school at an early age. Although there is some evidence to the contrary, it has been observed that dropouts beget dropouts. Teachers are often able to identify chronic potential dropouts, although the criteria they use in making judgments are often hard to identify. As measures, they are either qualitative or quantitative, based on teacher's long periods of observation of family habits. More often the identifications are fairly good "guesses" based on unproven criteria.

What Is a Dropout?

One of the problems in studying the dropout problem is the number of different definitions used currently to describe a dropout. Depending on which particular definition is used, the figures and percentages reported will vary widely. For example, the United States Department of Health, Education, and Welfare reported that the national dropout rate for the year 1961 was 40 percent. At the same time the United States Bureau of Census stated the dropout rate was 17 percent while the Department of Labor reported the rate at $33\frac{1}{3}$ percent. The reasons for these discrepancies were attributable, of course, to the definition used to describe a dropout.

The Office of Education accepts the definition of a dropout as a student who fails to graduate from high school with his class, using as base year the fifth grade. The Bureau of Census uses an arithmetical approach in which the total number of pupils in a given grade school is compared to the total number of children of that school age. The Department of Labor defines a school dropout as a student who does not complete high school. Certain states, county boards of education, and other agencies, individuals and study commissions have used numerous alternate definitions or modifications of the above. This merely adds to the confusion in studying the school dropout problem. In reviewing reports on dropouts one should exercise discretion in accepting figures without first ascertaining, if possible, the definition on which the data were collected. Because of the use or acceptance of various definitions of terms one should investigate and make certain as to how given reports and studies may be compared. There is obviously a need for a widely accepted definition of the term *dropout* in the delimitation factors guiding research in the collecting and reporting of data.

The authors and editor of this yearbook have agreed, for its purposes, that *a dropout is a youth or adult who has terminated his formal education before completing high school.*

Some Identifying Characteristics of Dropouts

It is usually dangerous and unwise to generalize, especially where human beings are involved. Each school dropout as a person is a unique case. However, as a group dropouts seem to be more alike than different. And dropouts as a group differ

from high school graduates. For these reasons it is possible to draw some limited generalizations on certain characteristics commonly displayed by the dropout group.

1. *Sex:* The typical dropout is more likely to be male, because most studies show that slightly more than 50 percent of all school dropouts are boys.

2. *Age:* The age of early school leavers is closely related to compulsory school laws. In most states students must remain in school until the age of sixteen. To be sure, there are exceptions and some eventual school dropouts manage to stay in school longer than the legal minimum age. But, the model dropout age is sixteen years. In other words, the typical dropout leaves school at the earliest age legally possible.

3. *Grade level at withdrawal:* Since the average dropout is approximately sixteen years old, most dropouts occur between grades nine and ten, depending on the number of previous grade failures. The next "breaking point" for grade dropouts appears to be during the eleventh or before the twelfth grade.

4. *Reading difficulties:* Most research reveals that dropouts as a group show marked deficiency in reading skills. Typically, the dropout is at least two years behind in reading skills. It is known, too, that success in school is highly dependent upon the ability to read. Thus, as a potential dropout begins to show reading weaknesses, his chances of success in school subjects begin to drop. Long before he leaves school the odds have built up overwhelmingly against his graduation. The situation is not unlike that of playing cards with the gods of fate who are using a stacked deck.

5. *Grade failures:* Most dropouts are either failing or doing poor work in school at the time of withdrawal. Many have failed at least one school grade with the majority of grade failures occuring in the first and second grades of the elementary school and in the last two grades (eight and ninth) in the junior high school.

6. *School dissatisfaction:* An important factor common to almost every school dropout is his dissatisfaction in some way with the school. Such dislikes may manifest itself in a number of ways including dislike for the teachers, the subjects offered, the school administration or even the peer group. Sometimes the

dropout may not yet have identified specific dislikes nor have vocalized on them. To be sure, however, he does dislike school.

7. *School attendance:* Dominant among the characteristics of the dropout group is irregular school attendance. Students who are headed for graduation usually like school and will generally make every effort to attend regularly. On the other hand the dropout looks to any excuse for not attending school. His record usually reveals poor or irregular attendance from elementary grades through the grade at which his withdrawal occurs.

8. *School life:* Many research studies report that as a group dropouts do not participate in cocurricular activities of the school. They do not go out for sports and seldom attend athletic events. In general they lack the ability to make friends easily and for this reason avoid social activities of the school. Doubtless this factor of social immaturity is closely linked with the dropout's dissatisfaction with his school.

9. *Home life:* The typical dropout is very likely to have parents who were dropouts; commonly, older brothers or sisters were dropouts too. His parents are either negative toward, or at least disinterested in, education. They offer little or no protest when the actual withdrawal from school occurs. Dropouts may come from families at any socio-economic level, but many are likely to come from the lower socio-economic groups. The dropout's parent is probably employed as an unskilled or semi-skilled worker. The family income is more than likely insufficient.

Portrait of a Dropout

It should be repeated here that there is no such thing as an "average" dropout; each individual is a unique case. Each dropout may possess one or more of the factors or characteristics previously mentioned. These may be apparent in multiple combinations within varying degrees of strength. Peculiar combinations due largely to geographical reasons, cultural locations (rural, urban, inner city) or because of ethnic or minority classifications may exist among certain individuals. For what it may be worth, the following paragraphs seek to portray The Dropout U.S.A.

He is a sixteen-year old student, probably male, who is either a ninth or tenth grader. In all likelihood he has failed

one or two grades previously. He does not like school, finds all kinds of excuses for not attending, and is doing poorly in his subjects. Chances favor that his intelligence is average but his reading skills are definitely below his grade level. He has acquired poor work habits and study skills. He is an under-achiever but mostly because he no longer tries. He does not participate in school activities and only rarely attends athletic or social events. His poor attendance record has brought him into frequent and unpleasant contacts with school officials. This has added to his feeling that the school has rejected him. He cannot be classed as a delinquent because to date he has never been in trouble with the law. It is quite likely that one or both of his parents were school dropouts, as well as an older brother or sister. Family interest in his schooling and his other problems varies from complete to mild disinterest. The family wage earner is probably an unskilled or semiskilled worker who provides an insufficient amount of income to support the family.

The Dropout U.S.A. is headed for unemployment or at best a low-level job with not much future. He realizes that he has little to offer an employer and this tends to make him bitter and pessimistic about his vocational future. It is likely that he will not hold one job for very long and will accumulate early a poor work record. His lifetime earnings will be less generally than those of the high school graduate. Sooner or later he will marry a young woman within his circle of friendship, probably another high-school dropout. Their children will start to school and the cycle will likely begin to repeat itself.

At this point it should be noted that the dropout is quite similar, in many ways, to the disadvantaged youth described in Chapter One. Males in disadvantaged groups are generally prone to withdraw into more satisfactory peer groups than those found in a heterogeneous group such as a public school. Withdrawal to more satisfactory peer groups within school occurs in both sexes. Reading difficulties and grade retardation (or failure) are very closely associated and both are common among disadvantaged youth and dropouts.

School dissatisfaction is prevalent in both groups because the instructional materials and method do not seem to relate to past experiences of the disadvantaged and potential dropout. This leads to poor attendance in both groups. Home life is similarly

inconducive to study. Similarities are so much greater than differences that one concludes that the disadvantaged youth could be identified also as a potential dropout. Other factors often enter into individual cases, however, which make for considerable potential dropouts among middle class children. The fact remains that a large majority of disadvantaged youth are potential dropouts.

Needs of Dropouts

In general, all youth have certain common needs related to their physical and mental stages of development. Thus, the educational, vocational, social and cultural needs of dropouts while they are in school are not unlike those of other students. The distinction between the needs of graduates and dropouts lies not so much in the character of a given need, but rather in the instructional material, applied reference and drill used in developing skills to meet that need. For example, all students have need to master fundamental skills in reading. In this regard dropouts have a greater need than the average student for reading as a vocational skill at typical use levels. As a group they show marked retardation in reading skills because exercises have little reference to their experience in living and their hopes for outside use of these skills. In other words, all students need instruction, counseling and assistance to help them meet their needs and to attain optimum growth and development through adjusting to real life situations. Before leaving school or becoming grade-retarded, the dropouts need additional and special attention to help them meet the reading-skills need through appropriate methods and with familiar media. Unfortunately, because of a number of static and traditional practices, schools fail to help potential dropouts overcome their imposed deficiencies.

Potential dropouts should be identified early and a special effort should be made on their behalf. This attention should be given early in their school life. They need timely assessment of their educational problems so that counseling efforts and remedial instruction can begin as soon as possible. Potential dropouts require considerably more motivation activity on the part of the teacher than the typical student. They must experience early a feeling of success in school work and a feeling of belonging to their peer group and to their school. Of all students in school,

potential dropouts must not be allowed to lag behind in attaining minimum skills. They are the least able to catch up!

Together with other youth, potential school dropouts share common needs including the following: (1) mastery of the tools of learning, (2) mental health and physical fitness, (3) consumer knowledges and (4) development of individual capacities. The latter would include appreciations of beauty, nature, art, literature and others as well as the development of creative expression and the intelligent use of free time. In addition, there are three needs common to all youth. Special attention should be given to these in the cases of potential dropouts. These three needs are as follow:

1. *Reading skills*: The relationship between reading skills and the dropout have been referred to previously. It is said that well over 90 percent of all school work is dependent upon reading ability. Unless he can read with understanding and enjoyment, the disadvantaged youth can look forward to poor marks and eventual grade failures identifying him more clearly as a potential dropout. Lack of success in school may lead to irregular attendance and school dissatisfactions which in turn will invariably lead to trouble with school authorities. Continued lack of reading success may also breed undesirable social relations at school. Dropouts often compensate for their inadequacies in reading by exhibiting inappropriate social conduct to gain recognition by the teachers, school administrators, and peer groups. Potential dropouts are frequently immature in the acceptable social graces and tend to withdraw from communicative contacts within the school situation. Thus the school problems of the potential dropout become compounded and progressively worsened. His troubles accumulate in number and in severity as he advances from grade to grade, lagging farther and farther behind his group in reading skills. Eventually he may withdraw from school because he believes that his ability to communicate is satisfactory for his out-of-school needs. There can be little doubt however, that early improvement in reading skills would improve his in-school as well as his out-of-school performance in communication.

2. *Vocational competency*: A quarter of a century ago the Educational Policies Commission recognized vocational competency as an imperative need of all American youth. This is

surely true today as well. This need particularly applies to the potential school dropout. The potential dropout needs vocational guidance and counseling. He needs to develop salable skills so that upon graduation or school leaving he may assume an honorable place in society among the gainfully employed. Occupational skill should be coupled with essential and appropriate technical knowledge regarding a family of trades or vocations. He should have a wholesome attitude toward fellow workers and the world of work. This should be well developed while in school.

Like other youth, the potential dropout needs frequent replenishment of pocket cash. Constant deprivation in the life of the potential dropout puts him in a more acute situation than the average middle-class, high-school student. Most potential dropouts come from families of a relatively low economic status. A factor often overlooked in high-school attendance is the cost of clothing, lunch tickets, attendance at plays, sports events, dances and other social activities. Many potential dropouts cannot participate simply because they do not have money to cover these expenses. Lack of money is often contributory to the feeling of a lack of social belonging. It causes a withdrawal from the social groups within the school.

One solution to this financial need is to provide a school service program of placement leading to on-the-job learning experiences. Such employment and training can meet the need for a constant replenishment of pocket cash while at the same time contributing significantly to a vocational competency. While accomplishing these goals the student could at the same time meet a high-school graduation goal. All this means that many potential dropouts would move out of this class into the potential high-school-graduate class. It means further that many would be much better qualified to obtain and hold a job when they eventually enter the world of work.

3. *Wholesome social behavior*: Social behavior is unquestionably one of the most important problems of a potential school dropout. Individual differences further complicate this problem so that a general solution is not applicable in all cases. Many drop out simply because they feel they do not belong to their age or grade level group; they have little or no school spirit and feel a genuine lack of belonging. Special efforts need to be exerted by all teachers and counselors within the school

to help those identified as potential dropouts to become more active participants in school life and activities. Efforts need to be made on an individual basis to help overcome social barriers and social inadequacies. Alleviating the cost of schooling through part-time employment could develop within the student feelings of success and satisfaction. The feeling of success should give more self-confidence and a better self-concept. Belongingness is of paramount importance in retaining the potential school dropout. For him to be respected by his peers for what he is and what he can do will help him regain a stature of respect. It must be remembered that the old adage applies so well to potential school dropouts: *Nothing breeds success like success.*

Literature of Significance

In recent years the dropout problem has received the attention of countless researchers, educators, social workers and agencies as well as governmental study groups and commissions. The reports of these groups, numbering in the hundreds, have appeared and are appearing in the current literature including general periodicals and the daily newspapers. Some doctoral dissertations and master's studies have been addressed to the dropout problem. Within the confines of this chapter it is impossible to condense and summarize all of such publications. Instead, this chapter will conclude with a brief presentation of a few pertinent publications which merit national recognition and consideration. Collectively these contributions represent a means for identifying the potential high-school dropout and offer a planned program for helping him to remain in school and to enjoy successful employment at his level of training and experience following withdrawal or graduation from school. The literature reviewed deals with the disadvantaged and potential dropout, his education and the special training of his teachers.

A National Education Association Report (11) *The School Dropout* is the result of a project sponsored by the Ford Foundation. The project was concerned with discovering school-related activities which might ameliorate the school dropout problem. A symposium was held in Washington, D.C., December 2-4, 1962. At that time papers were presented by several nationally-known authorities who had brought with them an accumulation of data relevant to the subject.

The School Dropout deals with "dropouts" and the potential implications. There are considerable differences among dropouts such as economical stability and a varied income. The school-rejecting, -perplexed, -inadequate and/or -irrelevant dropout are other types mentioned. Labor markets, economic developments, and upgrading of classes of workers are mentioned as economic factors involved in the educational thrust. Changing curricular attitudes and functions are aired, by giving the historical as well as modern philosophies. One of the papers attempted to present lightly the thesis that varied campaigns to retain dropouts will be successful only if the ultimate dropout does in fact occur at the proper time. This should be the strategy for remedial practices according to this presentation. The general background of the dropout and his problems are treated: poverty, cultural deprivation, race prejudice, migration, emotional disturbance and family problems are but a few. Psychosocial development and adjustment problems are named as factors particularly applicable to the potential dropout. Possible solutions to the problem are numerous according to the several papers presented. Interaction between home and school is particularly recommended to prevent elementary school failures and grade retardation. Field workers are recommended.

Some negative administrative practices are identified as (1) hoping for the problem child to exercise his legal sanction to drop out at age sixteen, (2) closing the school doors to returnees who may have dropped out previously, (3) inflexible grading standards, (4) rejection of adapting curriculum to student and (5) "dumping" students into special classes for specific training such as vocational education without regard for student interests or aptitudes. Although these negative practices are noted, the converse of such practices are also listed with variations.

Another National Education Association Report (11) *Guidance and the School Dropout* was also funded by the Ford Foundation. This report is based on presentations given at West Point, New York in May, 1963. At that time a symposium was held as a joint effort of the National Education Association's special Project on School Dropouts and the American Personnel and Guidance Association. The report addresses attention to the disadvantaged with implications for vocational counseling and guidance.

It has been made clear that the school climate has built-in natural deterrents to many students. One deterrent mentioned is the utter disregard for materials which relate to many students' past experiences. This leads to rote learning for some who soon become frustrated. The identification of potential high school dropouts is emerging in the elementary school according to this report. The plight of a dropout is described, and vocational development is treated as a remedial function to practice in high schools.

A functional program of guidance is presented showing "who does what" and "for whom" the services extend to out-of-school youth. A desirable school-counselor-parent-teacher interaction is outlined. Counseling techniques, counselor education and internships are described.

A very appropriate book for study is entitled *The Drop-Outs* (8). The authors are particularly attentive to the organization of the subject matter in logical order. The book is a report on a demonstration project of a pilot type. Caseworkers were assigned 105 students from twenty-five different Chicago high schools. Each student was selected upon his indicated intention to drop out of school and his having exhibited regularly certain prognostic dropout tendencies.

In studying the personality problems of these youth, *defense*, an adaptive mechanism of the ego, was quite prevalent. These defense mechanisms are classified according to their psychological significance. Character formation is dealt with in a very scientific manner. Diagnoses of school problems are carefully described. Some statistical findings revealed several interesting characteristics of troubled children in schools:

1. Boys, especially, experienced problems early in the elementary school.

2. Serious problems leading to school dropout in high school are actually a multiplicity of problems.

3. Girls at the adolescent period became increasingly frustrated. Unlike the boys their troubles were delayed until after the elementary school had been completed.

4. Schools and teachers often could identify troubled youngsters.

5. Some (few) parents had actually sought help for their offspring. The dropout-prone girls seemed to make better

adjustment regardless of intelligence. The authors seemed to attribute this ability to girls being able to relate easier to females who were largely responsible for them out of school as well as in school.

Those with higher intelligence responded quicker to treatment. Those treated early in school responded quicker, stayed in school longer and remained in treatment. About one-third of the students had symptoms of psychological discomfort. The outlet for this brought on activity (aggressiveness) among the girls and inactivity (inhibitions) among the boys. A majority were showing signs of growing character disorders.

Generally, the dropout was hard to engage in treatment. Casework proved most effective and those who coped poorly had hesitating or poor improvement. Maturity as well as intelligence increased the improvement rate. Parental maturity increased this rate also. Personality improvement affected favorably the retention in school, especially among boys. Absenteeism and antisocial offenses were found to be correlative.

The Drop-Outs points the way for scientifically improving the plight of early school leavers. Although it reports on a demonstration-type project, the program for conducting the study was designed very scholarly. One might question its reliability due to the relative small numbers of cases studied. Following studies have borne out many of the conclusions reached, however.

Campbell (1) directed his attention to the training of teachers for laboratory and manipulative type classes designed for disadvantaged and dropout-prone youth. Among his objectives he mentions an exploration of relationships between the "dimensions of the dropout-prone youth problem" and "occupational development" programs. He set out to discover also how to meet needs of disadvantaged and dropout-prone youth through unique vocational-technical laboratory experiences. Finally, he sought to arrive at a model for preparing teachers and teacher aids for these disadvantaged youth.

Campbell clarified the term "experimental" in the title of his project as being something "other than" the typical "experimental method" used in basic research. The study did include both "control" and "experimental" groups of subjects, however. More particularly, the study was one which made "direct contact

with learners" and experimented with a "field trial" of new approaches.

An advisory committee was established for the study, and participating teachers were recruited and selected. Students from an "Occupational Exploration Program" in Champaign, Illinois, were involved. Twenty-four were designated as the "experimental" population and ten as the "control" group. The main body of Campbell's report deals with the results of testing the population and control group; establishing an inventory for each subject; developing the guidelines for the media and methods of teaching; continuous follow-up procedures and an analysis and development of a teacher training program. In Campbell's report the conclusions are not as significant as the number and variety of techniques tried are interesting. His study should stimulate interest in and a challenge for developing sophisticated research design to test scientifically some of his more promising "experiments."

R. O. Gallington, while at Southern Illinois University, completed three major research studies on the school dropout. The first investigation formulated basic criteria for identifying potential high school dropouts. These criteria comprised two instruments: an objective and subjective instrument. In format, the objective instrument consisted of a weighted checklist of twelve factors including the following: grade retardation, absenteeism, reading and arithmetic placement, general achievement, extracurricular activities, number of older and younger siblings, economic status of the family, father's occupation, number of schools attended and with whom living. The reliability of this instrument was found to be extremely high. (2)

The ten-item subjective instrument involved an appraisal of the home and the student attitude toward his peer group, the school, school authority and rules and earning a living. Assessment was also made of the student's oral communicative ability, his poise, his apparent capacities and vocational choice and his occupational knowledge. The reliability coefficient of this instrument was found to be .85.

A year later the same investigator under a contract with the Office of Education conducted a research project in Alexander County, Illinois. This field study culminated in the report, "High School Dropouts: Fate — Future — Identification." (3)

These two studies were instrumental in establishing a basis or rationale for a three-year longitudinal investigation (4) under the aegis of the Illinois Board of Vocational Education and the Southern Illinois University. This research sought to identify success factors in retaining potential dropouts through an experimental and work-experience project.

The basic problem of this experimental study was to determine whether remedial practices involving occupational information, vocational counseling and cooperative vocational education would retain potential dropouts in two high schools in Alexander County, Illinois. Two major hypotheses were tested:

1. Potential dropouts, *under* sixteen years of age, when taught about occupations and given periodic vocational counseling will stay in school longer than they would otherwise.

2. Potential dropouts, *over* sixteen years of age, when provided with vocational counseling and cooperative vocational education will stay in school longer than they would otherwise.

Using the objective and subjective criteria previously mentioned, every high-school student within the geographical limits of the study was classed as either a potential graduate or a potential dropout. From this population, eight groups of students were selected at random. Potential dropouts and potential graduates were scattered through all eight groups. There was an experimental and a control group for each of four grades: ninth, tenth, eleventh and twelfth. The experimental groups proved not to be statistically different from the control groups.

During the first year in the ninth and tenth grade experimental program, both grades were taught as a single class. The treatment involved (1) occupational information (twice a week) and (2) individual counseling (one hour per month).

During the second year the large class was separated for two levels of instruction. One class was made up of those who had been in the program during the previous year. This group was offered a more advanced program in occupational planning (one period per week) and individual counseling (one hour per month). A new class was formed for the occupational information group at the ninth grade level. This group received the same occupational information that had been given the previous year.

In the first year of the eleventh and twelfth grade experimental programs, both grades were taught in a single class that met five times each week. The treatment involved (1) occupational information as well as how to get and hold a job and how to work, and (2) cooperative vocational education (on-the-job work experience).

In the second year of the eleventh and twelfth grade experimental program the following occurred:

1. The new juniors were given the same treatment as last year's junior group.

2. Follow-up records were kept on the twelfth graders who had graduated or who were out of school.

3. The current twelfth graders reviewed the previous year's occupational information, were given advanced material, and were given additional cooperative vocational education. As in the first year, the occupational information classes occupied five class periods weekly.

During the third year of the study, new classes were established in a manner similar to previous years. Content and treatment were about the same. Accurate records of all students, both in and out of the programs, were maintained.

Based on interpretation of the data which proved to be statistically significant at the one percent level of confidence (or better), Gallington accepted both major hyptheses and concluded that:

1. If potential dropouts under sixteen years of age were taught about occupations and given individual vocational counseling periodically, they would stay in school longer.

2. If potential dropouts over sixteen years of age were provided vocational counseling and cooperative vocational education, they would stay in school longer.

In addition to these conclusions, Gallington also found the following to be true for his population:

1. As students (both potential dropouts and potential graduates) moved through the three-year program, the number of transfers to other curricula in the school was zero.

2. After graduation from high school or upon leaving school, students who had been in the experimental group held better jobs generally than students in the control group. No student in the experimental group was unemployed.

3. As the study neared completion more students applied for admission than could be accommodated. This suggests that the programs were meeting real needs of the students.

Summary

The school dropout problem is not new because America has been plagued with it ever since schools were first established. In recent years the problem has attracted national attention. It has become of grave concern to our Presidents, Congressmen, Governors, and to other legislators and to the judiciary as well as to educators, social workers, and other special groups.

The dropout problem comes at a time of great industrial expansion and development, scientific advances and a general high level of prosperity in America. It comes, paradoxically, when our schools are enjoying the highest levels of attendance and graduation ever, that is, when the holding power of the schools is at its highest peak.

Although the dropout rate has consistently declined from 94 percent in 1900, it is the magnitude of the dropout figure which is appalling. One out of every three students now in the fifth grade will drop out before finishing high school. Annually nearly three-quarters of a million students drop out of school. More than seven million youth will drop out of school in the present decade.

To compound the gravity of this problem, it is known that out-of-school youth constitute a sizeable proportion of those involved in inner city and racial disturbances. Other related problems are the rising crime rate and delinquency among our youth.

Several definitions of the term *dropout* are in common usage. These tend to confuse the issue and to complicate comparisons among studies and research reports. For purposes of this yearbook a dropout is defined as a student who does not complete high school.

Each school dropout is an individual case. For this reason it may be unwise to attribute general characteristics to individual cases. However, dropouts as a group are more alike than different and as a group are different from the high school graduating group.

1. More boys than girls are school dropouts.

2. The modal dropout age is sixteen years.

3. Grade level at withdrawal is between ninth and tenth grade.

4. Reading skills are usually markedly retarded.

5. Failing in school subjects at time of withdrawal is common with a record of at least one previous grade failure.

6. Dissatisfaction with the school is expressed.

7. A long record of poor school attendance is typical.

8. Lack of participation in school life and in cocurricular activities is noted.

9. Dropouts usually come from dropout parents (often with other sibling dropouts in the family). The parents are not interested in education and are toward the bottom of the socio-economic scale.

The needs of dropouts are not unlike those of any other youth of the same age and grade level. But the needs of dropouts are more acute. They need timely assessment of their educational problems and early identification as potential dropouts. They need prolonged attention to their academic inadequacies and personal frailities. It is important (1) that they be motivated, (2) that they enjoy success in school work and (3) that they earn social acceptance in the school. Together with other youth, dropouts need (1) mastery of the tools of learning, (2) mental health and physical fitness, (3) consumer knowledges and (4) development of individual capacities. In addition, special consideration should be given to potential dropouts in terms of these three needs: reading skills, vocational competency and social conduct.

Over the years the dropout problem has been studied from nearly every possible vantage point and by numerous groups and countless individual researchers. It was not the intent in this chapter to seek to condense or summarize a large part of this

research. Instead, the findings of a series of three recent researches by the same investigator were presented. In the Gallington studies, criteria for identifying potential dropouts were formulated and it was discovered that vocational counseling and cooperative vocational education experiences caused identified potential school dropouts to remain in high school longer than would have otherwise.

Unless help is forthcoming prior to withdrawal, the typical dropout can look forward to unemployment or at best a low-level "blind-alley" job with no future. He is likely to become pessimistic about his vocational future and his lifetime earnings will be far below those of high school graduates. It is likely that he will not hold one job for very long and will gradually accumulate a poor work record. Sooner or later he will marry, and upon starting to school his children will begin to repeat the dropout cycle.

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CHAPTER THREE

Problems and Needs of Inner City Youth

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Americans are prone to hear a phrase or term and use it to explain the basis of all problems and to rationalize failure to meet certain desired goals. Hence, phrases and terms often take on varied meanings which tend to reflect the purposes of the individuals or groups using them. "Socio-economically deprived" is considered by some educators to be such a term. Attempts have been made to find other terms to describe the culturally and economically impoverished. Both are deprivations which are treated in this chapter, and either or both result in primary disadvantages to our youth.

Basic Needs of Socio-Economic and Culturally Deprived Youth: Some Cases in Point

The culturally deprived are those persons in our society who have been denied certain opportunities and experiences which result in the growth and development of well-rounded individuals who are able to adjust to a highly dynamic, technological society. They frequently grow up in homes of poverty in which there is considerable underemployment or unemployment. The accompanying economic insufficiency results in limited opportunities for the normal interaction to exist between parents and their children. Often, there is a high rate of mobility of such families, within a single locale, or from one locale to another. Education is sporadic, motivation is limited or nonexistent and there is a deficiency of actual and vicarious experiences.

Numerous culturally deprived are found in urban areas where vast opportunities abound, but as a result of poverty they are unable to participate in and enjoy the local cultural advantages. Many live a lifetime never becoming conscious of the

cultural opportunities which abound in their cities. Deprived people also are found in rural communities and small towns where the tax base is too limited to provide adequately for their educational and social needs and where cultural opportunities are limited. Many lack good conversation in their homes, companionship from their parents, books, trips to museums, visits to the legitimate theater, the opportunity to see good movies or big league games and many other things that middle-class America enjoys. Many culturally deprived persons are those in our society who are extremely class conscious. They have the kind of class consciousness that is undesirable, for it breeds within them a feeling of self-abnegation. They observe others who are affluent with material success, and have unlimited opportunities without social, cultural or economic barriers. The result is a feeling of hopelessness and despair. Culturally deprived persons exist at every level of society, but they are more frequently found in homes where incomes are extremely limited.

This is the long neglected segment of American society that has only recently received recognition. Too often, this recognition takes the form of generalizations based on myths, and myths hamper the search for remedial action. Hence, myths retard the accomplishment of needed social planning and reform. For this reason, the nation has been plagued with increasing social problems in recent years.

The Need for Understanding

The social problems which beset the American society have already reached the critical stage. They pose a serious threat to the implementation of democratic idealogy. Gunnar Myrdal, the Swedish social philosopher, recently noted that he believes that the United States is headed toward a total collapse of the social order if it fails to take massive steps to effect solutions of its serious problems. These social problems are juvenile delinquency, dope addiction, sexual promiscuity, unemployment and underemployment, undereducated youth and adults, racism in American life, religious prejudice, lack of relevance in education, crime and corruption, and the role and place of the aged. This list could be extended. Though they are dominant in all levels of society, they are generally more severe among lower socio-economic groups.

Education, more than any other societal agency or institution, has been looked to for solutions to these problems. Massive federal, state and local legislation, geared to these ends, has been passed in recent years. Programs have been created and funded. Although some of these programs have had positive effect, the majority have not. It seems reasonable to note that the programs which have been successful have been under the leadership of persons who possessed an understanding of the problems and even more importantly, the people involved in the problems.

The need for broader understanding and concern is paramount. This chapter will deal with aspects of the problems noted above as they relate to socio-economically and culturally deprived youth, many of whom drop out of high school before graduation. An attempt will be made to draw attention to some of the factors which shape their lives and to focus attention on their needs. The point will be made that the generalizations made about the socio-economically deprived are false when applied to all situations. It will be shown that individuals present many different pictures; indeed, they react to their environment in many different ways. The goal of this chapter, then, is a greater understanding of a large proportion of the American public school population, a consideration of implications for education inherent in the problems they face and the factors which contribute to the existence of these problems.

Environmental Factors Which Contribute to the Behavior of Culturally Deprived Youth

The Home

The home is one of man's oldest institutions. It is also considered one of the most important. The influence of home life on the community, as well as the influence of the community on home life and individual development and behavior are extremely important. A knowledge and understanding of the interrelationships between these agencies is essential to the planning of educational programs and the development of methodology which will provide youth with the kind of preparation and training which will make them contributing members of the society in which they live.

The presentation of descriptions of varying family patterns which can evolve in the same or similar communities will negate the common assumption that all socio-economically deprived families lack social awareness and cannot be expected to rise very far above their present level. The school cannot assume that these children are intellectually inferior and comfortably allow its programs to be oriented solely toward the middle-class, college-bound youth who themselves are demanding a redirection of education. Nor can teachers continue what seems to be a widespread practice of social promotion, which too often foists upon society a number of young people who lack even the basic skills required to enable them to follow instructions. Certainly, many of them lack the skills so greatly in demand in the present American society.

The homes into which socio-economically deprived youth are born lack many of the provisions which the more affluent members of society take for granted. Because of their low incomes, these families, who attempt to live according to acceptable standards, are forced to spend all, or the great majority of their incomes on the bare essentials of life.

Houses or apartments available to the socio-economically deprived are usually those which have been abandoned because of their obsolesence. They are generally old houses in need of repair. The ethics of real estate brokers who sell and rent houses to this group are often questionable. They sell or rent to the desparately poor, barely within their ability to pay. On sales the total principal is usually greatly increased to make for an extravagant profit and the interest is exhorbitant. Afterward, the payments on notes and taxes cannot be met and homes are lost. Those who rent are similarly fleeced so that the poor in inner cities are constantly faced with deprivation. Aid is frequently sought through charitable agencies. Failing to get sufficient help, some turn to prostitution, stealing, dope peddling or other socially unacceptable avenues for supplementing the family income. There is no place in such homes for good conversation, parental love, reading, relaxation and study.

It is often necessary for both husband and wife to work to attain a minimum standard of living. For the unskilled or semi-skilled, the work hours are frequently long and there is little time for either parent to supervise or provide minimal compan-

ionship for the youth in the home. Usually, the incomes of both are adequate to allow for reasonable conditions of life. There are instances, however, where the male member of the family cannot secure work because of the lack of competency in available occupations. Too often, this results in the female becoming the breadwinner. The resultant depreciation of self-image among males in this situation, as well as their inability to set examples for their youth presents numerous problems. The youth must look to their mothers for provisions usually ascribed to fathers. Moreover, they must look to males outside of the home for a masculine image. On fortunate occasions, the masculine image happens to be an athlete, an industrial arts teacher, a minister or some other person who exerts a positive influence upon the young. Too often, however, the masculine image happens to be a numbers writer, dope pusher, part-time handy man, petty thief or other person who exerts a negative influence upon them.

Another means of bridging the gap between extreme poverty and a more reasonable existence is that of renting rooms or sharing houses or apartments with relatives. It is not uncommon to find socio-economically deprived families renting rooms as a means of increasing their incomes. It is also not uncommon to find two or more families sharing a single dwelling as a means of making their incomes provide for basic needs more adequately. Privacy, which is greatly cherished in this country, is sacrificed as adults take over bedrooms which are often shared with young children. Older children are accorded accommodations which are inadequate for healthy growth and development. They use cots, roll-away beds and sofa beds, sometimes sleeping three or more to a bed. In numerous homes, girls and boys share sleeping rooms long beyond the stage of their development when such practice is considered appropriate.

Families, though goal oriented, because of adverse conditions find it virtually impossible to make provisions for their children which lead to their optimum growth and development. Too frequently, because the parents lack formal education, a family background which encourages a high level of motivation and varied experiences which contribute to general knowledge, they lack the will and knowhow to encourage their young to strive to excel in educational achievement. Children seldom, and too often never, share vacations with their parents, visit muse-

ums or discuss occupational aspirations and educational achieve-
ment. They are not exposed to family discussions related to matu-
ration, allowances and many other facets of youth interest in
home and family life. Youth are forced to turn to their own re-
sources in their attempt to meet their social as well as material
needs. It would be a mistake to assume that these parents do not
love their children, or that the children do not love their parents.
This is far from the truth. The pressures of living tend to over-
whelm them, and their backgrounds do not lead them to function
within the mainstream of folkways and mores common to the
middle class.

There are also homes, within the same community described,
where the parents are not goal oriented. The frustrations which
children, their parents and/or their grandparents have faced
cause them to view the process of getting along in life quite
differently from those working parents who are simply function-
ing below middle class standards described above. This group
is more likely to consider welfare provisions as their major
goal. They believe that the world owes them a living. More
generally, the woman is the breadwinner. Wages earned by
them are competitive with, or less than, welfare stipends. They
see little incentive in the kind of work available to them. They
are hostile to the system which they believe to be responsible
for their plight.

Among this group, future of the youth causes great concern.
Young people are aware of the discrepancy in values expressed
at home and those to which they are exposed in church and
school. They learn of sexual activity and prostitution at an early
age. It is common for women who share these values to live with
different men from time to time and to have children by them.
These children, more often than not, add to welfare costs and
are subject to view this means as their way of life. Indeed, the
great majority of these youth engage in smoking, fighting,
using dope, gambling, sex and other socially unacceptable
behavior at a significantly early age.

On the other end of the value scale, yet within deprived
communities and classified as disadvantaged, are a large number
of families who are goal oriented and whose children behave in
the same manner as middle-class youth in every respect observa-
ble. There are numerous examples where socio-economically de-

prived parents have nurtured, encouraged, and supported their children through college, and later higher level professional schools in universities. These parents have set goals for their children far beyond their own past abilities to achieve. In doing this parents have manifested the concern, love, guidance and care common to the more affluent. Typically they have been hard workers who have exemplified the social behavioral patterns through which their children learn. Such devotion and hard work has paid off in every respect.

The Community

If we accept the premise that the growth and development of the individual are influenced by all of the people with whom he comes in contact, all of the experiences to which he is exposed and the impressions he gains, we shall recognize that the educational process is not limited to the school. The effect of this knowledge of the total educational process should be a concern with the environmental influences which shape the individual. Effective teaching cannot be accomplished without this knowledge. Also, effective teaching cannot take place unless the teacher discards any preconceived idea that these youth lack intelligence. Frequently a superior intelligence is needed to enable a youth to survive in the ghetto. People who have distinguished themselves in some field of endeavor frequently indicate that their early years were spent in similar environments.

An examination of a few of the experiences to which the socio-economically deprived are exposed in their neighborhood should provide clues to planning educational programs which will challenge and inspire them.

The communities in which the socio-economically deprived live in urban areas are usually congested with dingy tenements and businesses. Play areas are meager or nonexistent. The tenements are drab, rodent infested and hazardous due to failure of the landlords to adhere to the minimum requirements of city codes. Until the recent concentration of attention on the poor, there was little, if any, concern demonstrated by governmental officials in securing any improvement in housing. The influx of native rural Americans to urban areas has aggravated the situation. Low rent housing is scarce, and the newcomers who join

relatives often move directly into their homes. The already over-crowded situation is thereby worsened. The newcomers, unaccustomed to urban housing and certain household equipment, meager though it is, do not know how to take care of the "home." The drabness of these houses does not create an incentive for occupants to take pride in maintainance. Bad housing, therefore, steadily becomes worse. Some housing projects which were built with the idea of correcting this situation were ineffective. Some were built without regard for architectural beauty, and often play areas for children were totally inadequate.

No outlet is provided for the young to indulge in the aimless roaming which so often provides the opportunity for them to daydream. This free play is essential to the development of creative talents.

Most proprietors who locate their businesses in these blighted urban areas put forth little effort to make them attractive. More often than not, the quality of the goods they sell is inferior and prices are twenty-five percent to one hundred percent higher than the prices of those businesses located in communities where the residents receive much higher salaries. This is one of the ironic things about these communities; the highest prices prevail where people are least able to pay.

The streets are usually the playgrounds of the youngsters who grow up in socio-economically deprived communities. They grow accustomed to running over garbage and dodging traffic. Rarely is there a vacant lot large enough for them to play ball. The background for their play includes sprawling drunks in doorways, dope adicts in search of a fix and prostitutes on the make.

The major excitement of neighborhood groups or gangs is found in fighting. Often fights are initiated to provide the excitement which the middle-class youngster gets through attending a football or baseball game with his father, an uncle, or an older brother, and through many other wholesome activities. Younger boys are taken on expeditions by older boys in the neighborhood. Many of these older boys are accomplished thieves who undertake the task of systematically educating their new recruits in the tricks of the trade. When the novice is fully oriented, their jaunts are often taken for the sole purpose of

providing a form of entertainment and excitement for the participants.

The factors described above affect youth in the same neighborhood differently. Indeed, they affect youth within the same family unit differently. One youth may not be able to compete with the aggressive youth in the neigborhood, and may withdraw into himself. Another may be stimulated to outwit them and may develop a great deal of self-reliance. One youth may be repelled by the suggestion that he experiment with dope, another might become an addict. Youth who grow up in this kind of environment present many faces. Each must be viewed as a unique individual.

Rarely is the child who grows up in a socio-economically deprived neighborhood provided with toys. His toys are whatever cast-offs he can find. He plays with bottle tops, rocks, whatever he can find in the streets, or just roams. He often forages in garbage cans and in the trash which litters the yards in his neighborhood. He rarely has an opportunity to listen to discussions of political or social events. He has few, if any, holiday or birthday celebrations in which he can participate. His contacts are with other persons who, like himself, are limited. He cannot express his feelings, nor can he describe his experiences, because he lacks practice. Most of the verbal exchange in which he participates is fragmentary or monosyllabic.

On the other hand, the middle-class child has more toys than he can play with. His experiences are many. He is present during some of the social activities which take place in his home. The conversation during meals is varied. He meets many persons who are actively engaged in interesting vocations or professions. He is motivated to desire what is recognized as success at an early age, because the people with whom he comes in contact are successful. He acts in a socially acceptable manner because he has learned through his contacts and experiences.

Implications for Educational Practices

When individuals or groups are deprived of iron, vitamins or calcium, they are given iron, vitamins or calcium until they overcome their deficiency. When individuals or groups are hungry, they are given food. When they are thirsty, they are given drink. Accordingly, when individuals or groups are socio-

economically deprived, they must be given doses of social development and/or substantive support essential to help them to overcome their state of deprivation.

Any new system designed to assist socio-economically deprived persons must be morally and intellectually honest. Persons instituting the system must be aware at the outset that the new system will immediately become suspect. The new system will have to overcome the attitudes instilled by an old system which was insensitive to the needs of the deprived; indeed, often hostile to their needs. It goes without saying, then, that those charged with or desirous of assisting socio-economically deprived youth and adults must prepare themselves for misdirected aggression. This aggression is not likely to disappear until discernible progress and sincere efforts are made. Sincere action consistent with democratic values holds the key to assisting culturally deprived youth and adults to improve their lot in life.

Cultural Factors Essential to an Understanding of Culturally Deprived Youth

A knowledge of the cultural elements to which youth are exposed is imperative if their interests, motivations, and drives are to be clearly understood. The culture pattern of youth should play a considerable part in the planning of the educational programs to which they are exposed, if the school is going to preserve their interest and prepare them for participation in the larger community. Educators must bear in mind the fact that these culture elements are common to other youth within a rather small geographical area. This is specifically true of socio-economically deprived youth. Factors which influence these young people include the family, other adults and their peers — their mores, traditions and values — as well as the organizations in which they or their parents hold membership. Their economic status governs the persons who influence the development of their attitudes and values and their recreational pursuits.

Family and Peer Group Influences

The great majority of youth have a strong need to be accepted by their peers. A very few youth want to be loners; most of them want to be accepted in groups of other youngsters who are within their environment. Any departure from this is usually a

warning signal that a youth has a serious emotional problem. Youth want to avoid being different. They want to be identified with a group. When the group rejects them, they are unhappy and often demonstrate this unhappiness by presenting discipline problems. Their behavior may simply stem from the need to be noticed; hence, the educator who works with those youth who present problems which seem to defy explanation will do well to check the status of their peer relationships.

The peer group influence is potent in any society, but the fact that, in most instances, both parents work and are away from home for long hours causes the youth from socio-economically deprived homes to assume responsibility beyond the level of their maturity. They, therefore, are under the influence of their peers to a much greater extent than the more fortunate youths. Again, it is a serious error to assume that the homes of the youth are void of love. The error results from the expectation that the behavior of deprived persons can be equated with that of middle-class persons. They may not talk to their children as much as do their more affluent counterparts, but this is due to their limitation in this regard rather than to a lack of love and concern for their children. This limitation and others are transmitted to their children. Youth, then, more often than not, learn about the world around them through their peers and through other adults in the community. When what is learned in the community is in agreement with what is taught in school, the school is reinforced. Too often, however, learning which takes place in the community is counter to and more effective than that which takes place in school. Parents, as well as other adults among the socio-economically deprived, tend to draw a sharp line between varying chronological levels. Children are too often required to leave the room when adults are talking. In many instances, the conversation would be helpful to the youth and the youth could make worthwhile contributions to it.

Few social affairs or recreational activities are engaged in jointly by youth and adults among the socio-economically deprived. For the most part, it is good that youth do not engage in adult social and recreational affairs. Too many of these affairs leave much to be desired. This is not to suggest that all recreational and social affairs enjoyed by this group are undesirable. The point against typing this entire group has been made. Their

commonality lies in the fact that they are deprived of economic resources and cultural enlightenment.

Organizations often provide cultural outlets for their members and their friends, but the organizations open to most Americans are often closed to those from deprived groups. The church and fraternal orders comprise the major organizations to which they belong in any great numbers. Other organizations to which they have access are social in character. Although these may provide an outlet, they cannot be considered a major influence in raising cultural levels. A new system imbued with democratic ideology whose leaders possess high moral standards and intellectual commitment is essential to the solution of the problems of the deprived, as well as others of the more affluent.

The church, masonic order, fraternal lodges and the like have principles which could be helpful to this almost forgotten segment of the American society. Yet, these institutions have not been effective in helping them to achieve favorable positions in the mainstream of American life. Although some hope persists, it appears fruitless to become over-optimistic about the possibility that they will yield more positive results. Little hope, therefore, can be held for organizations to play a significant role in eliminating the problems faced by socio-economically deprived youth.

Traditions, Mores and Values

The educator steeped in middle-class traditions and values, whose experiences may provide him with mores totally alien to those of the socio-economically deprived youth, is ill-equipped to make a contribution to the development of such youth. This is particularly evident in communities involved in the process of desegregating their schools. Many of the white teachers (and too often black teachers) believe that the solutions to these problems lie only within the province of parental responsibility, not considering the complete lack of such responsibility in some cases. There is a puritanic, arbitrary insistence upon the principle that teachers should stress honesty, truthfulness and strict obedience to rules and regulations. Little, if any, concern is expressed by teachers for the contributory causes of the absence of these values in a number of disadvantaged students. Fear is expressed, for example, for providing more integrated social situations

which could serve as educational media through which desirable social behavior could be practiced and learned. This indicates a wide gulf in understanding. Black teachers have a deep concern about the educational future of black children and their relationships with white children. They have a deep concern about white teachers' concern. The same feeling of deep concern would exist among Puerto Rican teachers, Mexican-American teachers or any teacher from a disadvantaged group himself.

The foregoing reactions are indicative of a need for a probing of the traditions, values and mores of the deprived. Any social worker who works with youth in deprived areas can cite instances in which children were taught to steal by an adult who used them as decoys. It has previously been mentioned that some of these youngsters learn to steal through association with their peers. Much controversy has been recently centered around the perpetuation of the welfare cycle through the fact that, in some homes, at least three generations of unwed mothers exist. A child reared in these circumstances does not have the same kind of dependence or need for a masculine image in the home as the child who comes from a home in which he has contacts with a father, grandfather, and great grandfather. The description of overcrowded living conditions makes it easily understandable that some youngsters view sex acts at an early age. These youth cannot be expected to attach the same significance to the sex act as a child from a home in which the privacy of adults and the protection of children is scrupulously respected. The child who lies to protect himself from the ire of a parent, burdened by a sense of hopelessness induced by the fact that he is unable to provide for the needs of the family unit, cannot be expected to cherish the truth. He may also have developed a code which downgrades the importance of loyalty to any person or group.

One of the most verbalized American values is a respect for the worth and dignity of man, another is that all men are entitled to equality of opportunity. A person who has always lived in an environment in which values were a reality cannot easily envision the erosion to the ego that constant denial of equal opportunities or constant lack of respect can do. The self-image is destroyed, apathy develops and educational and occupational performance is seriously impaired. The person who does

not have respect from others and who feels that superior performance will not be rewarded in kind will not value the need to respect the rights of others. This type of person provides the image of leadership for many slum children.

Often, the deprived child who lives in substandard housing attends a school that is physically unattractive and limited in learning aids and experiences, and is given a steady diet of college preparatory courses. The reasons the child is not interested in school are threefold. He does not have the background of experiences which will enable him to facilitate his learning through the process of association with previous knowledge. He is not able to perceive opportunities through which he can put his learning to use. A great number have not learned to value education. Most have been denied a development of their intellectual potential by these surroundings.

Another problem that many youth from socio-economically deprived families face is that they are often guided into a curriculum designed for terminal students, regardless of potential. By the time he comes in contact with someone who inspires him to pursue a program that will prepare him for high-level participation in a society of automation, the disadvantaged youth is too far off course to revise his educational program. At least to him it seems that way.

We should be reminded frequently not to stereotype disadvantaged youth. Many of them are reared in homes by parents who have instilled in them a high level of aspiration. They are loyal, honest and truthful. They have developed a healthy respect for education, and their goals are sound.

Implications for Educational Values

The school is charged with the responsibility of alleviating the failures of the American society. A large segment of the population has been and is experiencing a lack of advantages which has produced a very low level of social and cultural development. Some educators may view "covering for society" as an unwanted burden. This attitude will soon be dispelled, however, if educators are willing to accept the responsibility of providing society with citizens who can function effectively in an age of increasing leisure induced by superior technological achievement. They will then recognize that the school has a responsibility to bridge the

gap between technological advancement and cultural growth. They will recognize that the process of education must imbue the idea in students that they must be able to achieve speedy adjustment to a dynamic society in order to survive. They must become adaptable to change. Adaptability is a concomitant of effective group experiences which will supplement or, in some cases, replace the experiences which the deprived child finds in his immediate neighborhood. Thus, the mistakes of society could be less hard on disadvantaged youth.

The teacher must become fully aware of signs by which the gifted disadvantaged youth may be identified. He must learn to look beneath a facade of rebelliousness. He must realize that the unkempt, the apathetic, and the disinterested children of all races in all geographic areas may harbor the seeds of greatness. The truly great teacher will search deep into every personality to discover his gifts and motivate him to develop them.

Another concern of educators must be an acceptance of the need to plan a program of continuing education that will acquaint them with the cultural pattern inherent in the impoverished rural and urban areas. They also must recognize that the so-called "minority" peoples of the world are increasing in number, and eventually it will be impossible to escape the multitudinous revolt. It is also apparent that a social revolution is worldwide. Oppressed peoples, everywhere, are struggling to cast off the yoke that has imprisoned them in a vise of stagnation. These same people must develop a commitment to society by involving themselves in programs which will enable their youth to build a new set of values and begin the establishment of a new set of traditions. This will form the basis for establishing a new set of mores. Continuing education could afford an opportunity for many adults to pick up the desirable remnants of their lives.

Educators must develop an acceptance of the social benefits of integration. They must be realistic enough to recognize that each race or nationality represented in the fabric of the American population has a contribution to make, that the present stature of the United States was achieved because of the contributions from many cultures. It is a fact that all races and nationalities will and have benefited from integration. The American society is a pluralistic one and always has been. From the discovery of America the American Indian has been treated as

an inferior, although for many years his tribes outnumbered other combined nationalities of settlers by tremendous percentages. Even between Indian tribes there was a wide difference of people, and these groups generally rejected each other. The mistreatment of these natives, and subsequently the mistreatment of "inferior" peoples migrating from other nations, has been a terrible blight on American's history. True integration and mutual respect could be a great force in erasing this blight.

Considerations Related to the Interests and Aptitudes of Culturally Deprived Youth

Testing has become an integral part of the American way of life. A satisfactory performance on a prescribed test is a requirement in numerous occupations. Since the school has the responsibility of educating American youth, this fact must be taken into consideration in planning the educational program. Other social agencies need to consider the impact of their programs because motivation and environment factors influence intellectual growth and development to a considerable degree.

Intelligence Quotients

For a long period of time, educators have engaged in controversy that has centered around the interpretation and use of intelligence quotients. The issue that has dominated the controversy has been heightened because a large number of socioconomically deprived youth and adults score consistently lower on standardized tests than do those from the more privileged classes. At one time, persons who made low scores on these tests were considered inferior, and they were permanently classified. More recently psychologists have gathered a great deal of information to substantiate the fact that when youth from culturally deprived families are placed in new environments and given compensatory instruction in schools, they score higher on these tests. Some educators then revised their opinions, now believing that perhaps there is a definite correlation between the level of cultural development and test performance. This takes into consideration the intellectual potential which has been stifled by deprivation (32: 155-169).

Authorities are in general agreement that race has no bearing on the intellectual ability of the individual. The civil rights

struggle focused greater attention on this issue, however, because Negroes and other minority races comprise a large percentage of the culturally disadvantaged. Negro leaders have charged that the tests are culturally biased, because they are oriented to the experiences of the middle classes. Authorities agree that cultural bias does exist. Despite some efforts which have been made to eliminate this inequity, little success has been reported. New tests should be developed which would measure all groups of society on an equal basis, dispelling once and for all the inequity caused by the cultural gap between societal groups.

An example of cultural bias is the fact that most standardized tests require that the examinee read rapidly and display the ability to interpret relationships and draw conclusions. The youth from the culturally disadvantaged home and neighborhood has lacked exposure to reading materials and many other avenues through which general information is gained. Consequently, he has failed to develop this kind of facility. Much of the material contained in these tests is alien to his culture. He has no background information to assist him in relating to the subject at hand.

On many occasions, teachers have observed during a given testing period, that a number of students approach the test with what appears to be total unconcern. Some have been heard to remark, "They don't do anything with them." Apparently, some students actually believe this. Some of those who exhibit unconcern may be overcome by the sheer weight of the number of words to be read in such a short time. They can be seen looking around the examination room long before the time period for that particular section has expired. They appear unable to concentrate. Frequently, they cannot read the test. Other youth, equally disadvantaged, exhibit a sense of purpose when they approach the examination. They work diligently in an effort to make a creditable showing. They seem to be fully aware that a good performance can be beneficial.

The contrast in these two groups of students is indicative that the influences in their lives have either been different, or their individual responses to these experiences have varied greatly. Another factor which may account for different responses is that the levels of aspiration of the subjects may be diametrically opposed. The third factor is that a large portion

of those students who exhibit apparent lack of concern may be seriously deficient in the basic skills.

Motivation

Motivation is of primary concern when an attempt is made to determine the relationship of interest and aptitude to the intellectual growth of the culturally deprived. A youngster who has made remarkable progress during the early years of his schooling can suddenly baffle the adults who are working with him by doing an exceedingly poor grade of work. He becomes careless about his assignments, his test grades drop alarmingly, and he appears to be completely unconscious of what is happening around him. This youngster has lost the drive that made him excel. Another youngster who, according to standardized tests, should perform creditably in his classes is frequently absent from school. When he attends school, he exerts such little effort that he earns failing grades in his classes. Other youngsters maintain their alertness, perform well in classroom activities, volunteer for extra assignments and score in the upper tenth of their classes on tests. All of these youngsters may be disadvantaged.

The first two youngsters lack the desire to learn and are apparently not goal-directed. The last youngster has maintained the drive which enables him to excel because he is goal-directed. The motivating force which is essential to successful performance on any level of society is usually initiated externally. The home is the first social agency that influences the desire to achieve. The parents of disadvantaged youth are sometimes so completely immersed in a struggle to provide for basic needs that they have little time to demonstrate concern for their advancement. The youth is often ill, hungry or in need of adequate clothing. His major concern quite naturally is focused on his basic needs. Little thought is given by parents or children to the preparation for a vocation or college. Goals are immediate. Concern for paying the rent, finding the money to purchase the next meal or securing assistance in getting medical aid is of primary importance. Small wonder that no attention is paid to making preparation to adjust to society or the community at large. The rigid structure of the curriculum to which they are assigned has little meaning to them. They are unable to exert sufficient

will to apply themselves. The hungry, ill-clad and possibly half-sick youngster has little on his mind except himeslf.

Other disadvantaged youth may be exposed to the influence of those youngsters in their peer group who have dropped out of school. The freedom of those youth from routine is attractive. Many of the adults in the neighborhoods spend their days idling on street corners. Others survive because they have learned to "turn a fast buck." It is difficult to maintain a sense of direction when those people around you have no objectives. Youth from socio-economically deprived neighborhoods are often surrounded by patterns of conduct which stifle initiative. They often do not develop an interest in accomplishment, because they have not been exposed to people who are motivated to strive for success.

Some youth who grow up in disadvantaged neighborhoods are confused because of the disparity between patterns of conduct surrounding them and those taught to them in school. They turn to the school for answers; but answers are often not forthcoming, largely because educators do not understand the questions or need for answers. This should pose a challenge to educators because if these youth are to find the direction they need, the cry for guidance must be recognized. It must be recognized that when at all possible guidance of youth should be articulated in the educational program.

Cases in Point

In one high school, the students were led into a boycott that threatened some of their extracurricular activities. Many of the teachers were concerned about their futures, because many of them would possibly not be able to attend college without scholarship aid, and many of the scholarships were awarded on the basis of outstanding performances in football, basketball, track, band and choir. When the students found that their standing in the association that governed these activities was in jeopardy, their cry was, "None of you will tell us what to do."

On another occasion, a group of high school students were informed that the hour of their commencement had been changed. They requested a meeting with the principal and some of the teachers. Many of their comments revealed that the principal and teachers had failed to recognize that many of the discipline

problems in the school stemmed from an inarticulated bid for direction.

One comment:

We, as students, receive more criticism than constructive ideas which will help our situations. There should be a basic understanding between a student and a teacher. Agreement should exist between them. As far as I am concerned, my school has not shown any potential for this kind of agreement in the five years I have been here. Basic understanding does not exist in the classrooms. Students have knowledge of immorality of teachers and rebel. Teachers allow their attitudes toward what they consider socially unacceptable behavior among students to reflect themselves in classroom situations. The majority of the students suffer because of the actions of a minority.

Another comment:

I think that all problems can be solved if the teacher and student would sit down and talk over the problem they are facing. A teacher feels that he should be the only person to tell what he's going to do, but he should give the student the time to express himself in a respectful way. A teacher always wants respect, but when he gets mad, he loses his respect for the student and hurts the student's feelings in front of his classmates. If a teacher would only count to ten before he talks to a student, he may save a friend. A new teacher should begin to get respect on the first day of school. He should assume control but should keep in mind respect. Some students like to test teachers.

A third comment:

The young adults today are constantly being criticized by the older adults to whom we should be turning for advice and leadership. The teachers of our schools who are in a position to tell us what should be done will wait until we do what we think is best, and then say, "You're wrong." They don't tell us how we are wrong. We are not given the right to question our elders; we can't wait forever to get the advice which we need today. The whole matter is that the teachers are more interested in their jobs than the education of the students. If we had a few teachers whom we could trust to tell us the truth and not think that school is out at 3:15 p.m., there would be a great change in the conduct of the students of .... and at least 99.9% cooperation among them. But, as it stands, we are being fooled, our education is being ignored, and our freedoms are being denied.

A final comment:

High school, as it is supposed to, contributed to me morally, socially and educationally; however, the situation that I find my school in results from too much lenience with students. We are in a new situation or build-

ing under a new principal. I feel that letting the kids have their own way has gone too far in our school. A school has to be strict as far as demands on students are concerned. Animosity exists between faculty and students to the extent that open clashes result. The school is run too much on a psychological basis instead of establishing definite ground rules. The procedure does not fit the class of students being handled.

The honest educator who is deeply concerned that the educative process meet the needs of youth will, no doubt, read in these candid expressions a cry for help. He will read into them a warning that if he does nothing to meet these needs, disaster lies ahead.

Implications for Educational Practices

It is possible that educational circles have been too deeply insulated to develop an awareness of the need to change. Despite the threat of present student protests against public education, this lowering cloud may indeed have a silver lining. Educators may be shaken from their apathy and complacency and admit that a need for change exists. This is a giant step for those who had hoped to remain in their philosophical cocoons of yesteryear. This will be extremely painful for those educators who judge student performance and reaction by that which characterized their school experiences. They must take this step, however, and they must follow through with the complete reorientation of their thinking. They must learn to listen to the cries for help which may be completely veiled by defiant disregard for authority — cries for help which the youthful protesters in their rejection of the status quo may not realize they are uttering. The towering wall of separation between educators and those whom they are educating must be destroyed. Myths which have provided the foundation for stereotypes and the callous disregard often exhibited for the needs of the difficult youth must be dispelled. There will develop in their stead a careful and sensitive probing of their needs, and an open-minded study of the environment which poses the painful problems which beset the disturbed youngster. There will emerge a creative search for a program and new approaches which will be relevant to these times. Educators will become open-minded enough to recognize that careful, constructive program planning must be constant.

The staggering speed with which changes are occurring in our world and the revolutionary search of the masses for "a

piece of the action" and opportunity for self-realization is forcing a showdown. Educators must become aware of these changes and must become receptive to the need for a radical change in the content of curricula and the methods which the schools must use to instruct young people who are completely different in their outlooks and responses to those who must provide their training. Young people who have been able, through the eyes of the television camera, to view Mars, Earth, and the surface of the moon, cannot be expected to be challenged by the educational content and methodology of the agrarian age.

All of this poses a challenge to educators that is of great immediacy. First of all, there must be acceptance of the need for revolutionary change in the entire concept of education. Then, the need for initiating experimental programs which may produce administrative headaches must be accepted. Another step which must be taken is the stimulation of the teaching force, students and community to become interested in vitalizing the educational program. Several experimental programs can be initiated in a single system. Systems in regions can plan cooperative experimental programs, exchange findings and implement educated revisions. Resource persons who can serve in an advisory capacity may include professional educators, businessmen, industrialists, social workers, government officials and policemen, to name a few.

Sometimes teachers, in their frustration from the increasing pressures of the national and local communities, rail against society for expecting the schools to solve its thorniest problems. To understand why this situation exists, it is essential that educators keep in mind the fact that the public school system was created to meet the needs of society. In colonial America, ministers had to be trained, children had to learn to read the scriptures and later immigrants had to become Americanized. We could continue throughout the economic, political and social development of our country and we would find this general trend. The scare of communist infiltration made it mandatory that public schools include units or courses that informed the American people about the history and methods of communists. Russia's Sputnik caused Americans to introduce crash programs in science and critically examine the objectives and content of educational programs. It is not expected, therefore, that educa-

tion can escape the responsibility of educating Americans to meet the demands of the social revolution, the milestones achieved in the space race and advancing technology.

Educators have a responsibility to engage in the kind of public relations programs which will project an image that will secure the kind of financial backing from a tax-burdened public and wary politicians that is so desperately needed. Programs will have to be developed which will help youth evaluate and select occupations, skills, values and attitudes, as well as develop a sense of responsibility. Young people must learn the importance of past achievements and these must be used to help them understand the present explosions in technological and general knowledge. They must be motivated to recognize the need for continuos study if they are to make the constant adjustment demanded by this age.

Every available segment of society must be utilized and made to contribute to their development. Education must begin much earlier. Educators have programmed education to fit existing facilities entirely too long. It is imperative that every resource of the national, state and local communities be utilized to provide facilities as they are needed. Counseling will have to begin much earlier and must ecompass the entire family unit. Social workers must cooperate in helping to improve the environment in which these young people develop. All of this must be done with education at the center and the other agencies in society cooperating toward the achievement of common goals.

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Industrial Arts Teachers for Disadvantaged Youth

JAMES R. HEGGEN

For disadvantaged youth there is nothing more important than qualified teachers, for the teacher is the key to education and learning. Even with all of the innovative teaching machines, aids and educational paraphernalia being tested and used today, the classroom teacher is at the heart of all educational endeavors. The curriculum, too, has a place of vital importance, but the curriculum is a plan by which the teacher "bends" to meet the individual and personal needs of his students. The teacher's technique is the result of his testing many methods and discovering the most effective way of communication, to effect an objective change in the student as a result of his learning. It follows then, that our educational programs will be only as effective as the teachers serving them. Problems dealing with the teaching act can be solved only by the teachers involved. Education today is having to call on many teachers to help in solving one of the most overwhelming problems it has ever faced. To educate the disadvantaged child has recently emerged as a pressing responsibility of society. Doubtless it has been, for many years, a perplexing problem of teachers, but within recent years its impact has become decisive in our societal structure.

The Teaching Situation

Nowhere was this situation more clearly identified than by Frederick Shaw. According to Mr. Shaw, offering culturally deprived children the type of education which will meet their needs is the greatest problem facing educators in urban areas today. He believes it possible that by 1970 one of every two students attending public schools in this country's 14 largest cities can be considered to be disadvantaged. Clearly this indicates the pressing urgency of the problem (12: 285).

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In dealing with absolute numbers rather than percentages, it has been estimated that we now have more than 14 million children who are designated literally by the term, "disadvantaged." The number is growing rather than diminishing because of the increased numbers of children continuing in school by the regulation of increased compulsory attendance.

It may be true that these numbers are merely being discovered and that they have been long with us in education, but all at once we are discovering them and it is no longer possible to ignore them. Our society will not allow it. Because of (1) tremendous numbers of children who have become identified, (2) the changing attitude and discovered rights of the poor who shout loudly for change, and (3) a society with a government which is becoming more mindful of its needy, we can no longer deny adequate teachers both in numbers and in quality. Logic points clearly to the fact that if these vast numbers of youth are neglected by our schools, we will be dealing with these same individuals later — on welfare rolls or in crime statistics.

Should the number of teachers with a specific type of training be increased at a ratio of one-in-three or one-in-two? More and more, all teachers are feeling the need for specific training for teaching the disadvantaged. It has been estimated that many or most industrial arts teachers should be specifically trained to handle disadvantaged youth.

Realizing that the problem has been with us for some time, it seems logical to examine whether we have made any advances pedagogically. After an examination of selected schools (1964), the Panel on Educational Research and Development concluded that by every known method of evaluation the majority of urban and rural slum schools must be considered failures. In support of its conclusion, the Panel pointed out: (1) the severe academic retardation which steadily grows worse as these children grow older, (2) a dropout rate in excess of 50 percent, (3) a percentage of less than five percent pursuing any form of higher education, and (4) a tremendous number of these children leaving school ill prepared to participate in the community or to lead a satisfying, useful life. (10: 29-38) The failure of these schools becomes more understandable by the findings of research which indicates that many such inner city schools quite generally attract the teacher with limited or no experience and manage

to retain only those with the least ability or likelihood of success elsewhere. It would be unfair to claim that educators are not concerned about the situation. Regardless, successful programs have been few in number, trained and dedicated teachers are difficult to locate.

Glenn Newhouse recently made reference to this problem when discussing the vast numbers of new programs to improve the teaching of basic subjects. He indicated that, in all parts of the country, generally the children in these special classes have not made any more progress than those in like schools outside the programs. He felt that the three-year effort in compensatory education has now proved how futile it is to intensify existing methods and techniques which completely failed the first time. (9: 2)

The "old" methods and techniques contributed to the lack of success in these special classes. To achieve success there must be a change in methods and techniques, not just an intensification of the same old unsuccessful methods of the past. The right approach would be to investigate the disadvantaged child and the problems he faces in and out of school, trying to predict his path of advancement to higher grade levels and his probable employment after leaving school.

In school we know that the disadvantaged child is often rightly classified as a slow learner. The learning style of such children can be considered to be the inductive, not the deductive, discovery style of learning. It is far easier for them to make generalizations if the process is started with a particular concrete item which is within their general frame of reference. (7: 434)

The learning of the slow learner is often non-verbal. He must rely on the concrete as a basis for any conceptualizing; he must be provided with a thing-oriented curriculum before he can move to a verbal-oriented curriculum; he must make use of manipulative activities to try and improve cognitive ones. In addition, we know that such a child often has unrealistic vocational goals, and usually is completely unprepared to face the general world of work. He does not understand business or industry, not to mention his own place in society. He is often emotionally and physically unprepared to assume any employment role in industry.

A Look at the Past

In the 18th century, the Age of Reason brought great public demand for a new education. Growing interest in human welfare, education for citizenship and general preparation for the world of work resulted in a new approach to education — the pschological method. This method motivated and instructed from "things to words," as opposed to the then traditional rote methods. The new philosophy of education was implemented first by men like Pestalozzi (Industrial School 1771), Fellenberg (Farm and Trade School 1799), Froebel (Kindergarten 1816) and Herbart (Educational Methodology 1875). Pestalozzi developed and sold his new method of instruction in the educational market. His school was basically characterized by realism and the curriculum was geared to the abilities and needs of the working man. Special schools were needed to solve the problems of poor and delinquent children and by the close of the 18th century both Pestalozzi and Fellenberg had established schools for underprivileged children.

Examination of the Pestalozzi school at Yverdun and the Neuhof School in Switzerland points out how closely the Pestalozzi philosophy and technique mirror the most recent philosophies and techniques for educating the disadvantaged which we still have with us today. His fundamental concept was that impression is gained only from expression and ultimately "doing leads to knowing." He believed that simply cultivating the academics with no attempt to develop skills resulted in a narrow education. (Today we are forced to admit it often ends in no education.) Pestalozzi was aiming at what was basically educationally relevant to the learner in his time. By the accepted phenomenon of history repeating itself, we are back again with this same goal. By relating historical experience to current educational "knowhow" the problem of providing meaningful education for the disadvantaged could probably be solved. We simply must implement programs which combine manipulative true life experiences integrated with basic studies, using a relevant curriculum and workable teaching methods. What better media than those of industrial arts are available? What changes in the traditional industrial arts are to be affected? Many educators in our historical past have pointed out ways;

few have followed their recommendations with dedication and
zeal.

John Locke (1632-1704) advocated that all education should
be geared to fitting a boy for practical life whether it be a simple
gainful occupation or a learned profession. He believed in a
working school geared to the occupations and professions of his
time. Almost all peoples of past and present generations want
to be a part of our society by entering it, getting involved and
being identified with it. The schools are a part of the society
according to John Dewey, and should provide real-life experi-
ences to all youth. These experiences should be rewarding and
fulfilling to the degree that all school youth would feel that they
are a part of the society *now* as well as in the future. The key
to success in any educational endeavor is working purposefully —
involving commitment and fulfillment. Can we make industrial
arts this kind of an experience for disadvantaged youth? If so,
we will mitigate the general learning process for them and
attain goals advocated by Locke.

The Need of Special Teacher Education

Industrial arts teachers often come from the so-called
"middle-class" society. Actually, very few disadvantaged youth
have had an opportunity for teacher education. Therefore, there
are very few teachers who know the plight of disadvantaged
families. Of those who do know, very few know what some of
the real neighborhood situations are like in a disadvantaged
"blighted" area. Industrial arts teachers of disadvantaged youth
should include in their training the psychology of certain slum
community groups and ethnic cultures. Studies of the hopes or
hopelessness, aims and aspirations of disadvantaged youth and
youth gangs should be a part of the education of industrial arts
teachers for disadvantaged youth.

The proverbial industrial arts project will have to "go."
These disadvantaged youth may be slow learners but many are
able to see the disparity between the old "footstool" and a life
of fulfillment. The old project will not cause the disadvantaged
youth to become involved or rewarded. It will intensify his revolt
against all education and the industrial arts teacher in particu-
lar. On the other hand, he will "buy" total involvement with real-

life industrial situations. He simply asks for our main objective: an interpretation of industry! Can we give it to him? If so, we will be successful; we will gain his confidence and support; we will have made of him a true friend of industrial arts.

To begin with we must establish for the schools and industry and most importantly for ourselves, what industrial arts is. At this moment, facing an overwhelming problem of educating unbelievable numbers of disadvantaged and hostile students and knowing that we have so much to contribute, we can ill-afford a "patchwork" presentation of goals and purposes and responsibilities. As we argue over what we should teach and where we should fit into the educational jig-saw, we see countless thousands of youth being denied the opportunity of becoming involved with industry through industrial arts. Our opportunity to shape thousands of lives positively to contribute true meaning to education and to relate school to the world outside may fade away if more objective goals are not established. Realistic goals will be attained and belief that any practical arts education is something "less than" respectable education has to be accomplished. A true integration of subject matter has to be established so that mutual complementation is achieved. This takes total involvement in the educational program by industrial arts teachers. It must be made clear to disadvantaged youth that similar industrial arts for all students, not just for the disadvantaged, is a part of the general education of most American youth. Achievement levels must be established to guarantee youth values of industrial arts programs to meet needs of all levels of interest, aptitude and capacity among disadvantaged youth.

Some New Approaches for Teaching

There are many new approaches and concepts which may enhance industrial arts in its contribution to the education of the disadvantaged. One approach is to present industrial arts as the prime mover in *career development*. A continuous industrial arts program starting in elementary school and continuing through secondary school should be recognized for its career preparation value. As a means of preventing disadvantaged students later from feeling inadequate in industry, this approach has unlimited potential. Another vital point in favor of such a program is that a continuous laboratory experience would provide unique

opportunities for students to gain manipulative experience, reinforcing their confidence and helping them to achieve easier in the more conceptual and abstract type of learning. Disadvantaged children learn by doing, as all children do. They particularly need a realistic curriculum and realistic materials of instruction. They often make unrealistic career choices based on hazy concepts and a lack of understanding of the world of industry. With the career development approach they could be gradually exposed to many exploratory experiences related to gainful employment. Accomplishment at an early educational level would provide for reinforcement for the valuable school years ahead and prior to the legal dropout age.

Philosophies now widely accepted would apply to such a program. It is not that a new philosophy is needed; it is that more of a commitment to our philosophies is needed. We are concerned with the whole child, his academic, social and economic well-being. This involves a whole educational program, not just a course or a grade-level offering.

The Washington Symposium on Industrial Arts (6) suggested to teachers that industrial arts be extended downward into the lower grades. The position was taken that the content and activities in industrial arts have an important function in establishing relevance to the total elementary school program. This relevance was particularly noted in inner city schools where so little opportunity exists for relating common learnings to the experiences of deprived children. The self-image of inner city children is improved through industrial arts experiences, according to the report on this Symposium. Perception is developed and the intelligence potential is enhanced greatly by the introduction of industrial arts at the elementary school levels.

The Washington Symposium was held on August 17-18, 1968. Participating in the Symposium were about one hundred persons, all leaders in industrial arts, education, industry and government. Symposium topics concerned particularly with industrial arts for disadvantaged youth were: (1) "Industrial Arts in the Inner City Schools," and (2) "Why Your Child Needs Industrial Arts." The latter dealt with all grade levels of the public school.

Hardly any one subject matter area could overcome years of frustrating student failures with irrelevant material. All common

learnings teachers should work together in search of materials and methods for meeting specific needs and reaching disadvantaged youth in elementary schools. During this, it seems appropriate to take advantage of the "command performance" in elementary schools to provide the "pound of prevention" and deter or prevent the probability of an untimely dropout.

A second program which should be promoted actively is the involvement of *team teaching* in industrial arts. Within the industrial arts laboratory, experiences can be provided which involve every facet of the common learnings program. Complex projects of the broad industrial involvement type will make use of language arts, mathematical practices and scientific knowledge and necessitate cooperative teaching. The students will "learn by doing" according to our most respected authorities on teaching and learning. A learning environment characterized by industry would depend on resource people from the language arts, science fields, mathematics discipline, social studies and the like. Cooperative efforts made by teachers teaching as a team would make lasting impressions on youth. Glenn Newhouse (9) cited *experimental research* which combined mathematics and some industrial arts construction work. The conclusion was that significant improvement occurred in both learning speed and retention when the two subject areas were combined.

Further indication that there is hope for such a program can be found today in new programs such as the "ES 70" pilot program (Educational System for the Seventies). This program, concieved in 1967 at Fort Lauderdale, Florida, represents an attempt by local school districts, state departments of education and the U.S. Office of Education to develop a new horizontal and vertical integration of subject matter fields in the belief that this type of educational arrangement can be made more relevant to the needs of the student.

As exciting as these new programs may sound, they need common applications of many facets of educational disciplines or subject-matter fields as could be afforded by industrial arts media and methods.

Teacher Preparation

Industrial arts teachers must be trained for immediate adaptation to problems in teaching disadvantaged youth, more par-

ticularly in the inner city school. This preparation is rooted in the area of special education. Current practices of sending ill-prepared teachers into these difficult situations is resulting in the creation of further alienation among disadvantaged youth. It also creates a situation where teachers, as well as the students, are greatly disadvantaged. College teacher educational patterns and curriculums are going to need vast changes. Greater success ratios will be attained through a more relevant preparation. In a daily diary, written by a student teacher working with disadvantaged students in an experimental project, reference is made to teacher preparation:

> We are really concerned with attitude. The attitude of teacher and student. Almost any curriculum will work if the approach by the instructor is correct . . . . This to me indicates that teacher preparation for this type of student is of much more importance . . . (5: 94)

Even though this was written at the end of a frustrating day in the industrial arts shop, there is a great amount of significance in the statement. It points up the need for special training to prevent the loss of teachers as well as students. Other student teachers in industrial arts must get into such classrooms long before they are actually assigned to teach there. There is a considerable difference between reading about how to do something and actually doing it. To a significant degree, internships should be increased. Teamwork will be of great value to teachers in preparation in order to develop the reinforcement needed for meeting the challenge.

Not only new field experiences but, also a new type of course work will be necessary. Donald Maley has some specific suggestions to offer along these lines. He feels that to prepare for teaching assignments with groups which have special problems, the teacher will have to expand his curriculum to include special education, sociology, economics and communications (13: 100). The greatest handicap of teachers recruited from the middle-class society is that they do not know what other levels of society are like. As a result, they hold up the standards of their culture which is not comparable to the culture of the disadvantaged youth they teach.

There is some encouragement to be taken in the fact that some universities are developing programs of teacher training

for specially handicapped children. A survey conducted by the American Association of Colleges of Teacher Education revealed that 200 institutions now include or plan to include programs designed specifically to prepare teachers for disadvantaged students. Among the programs most widely known is The Bridge Project at Queens College (14). This project was aimed at discovering how teachers can be prepared to help slum children learn.

The Project Beacon Training Program in the Ferkauf Graduate School of Education at Yeshiva University is a long-range program dealing with all aspects of education for the socially disadvantaged. The "Project Beacon" started during the scholastic year 1963-64 with small groups of prospective teachers in elementary education participating in services, courses and internships. Subsequently, the program was to extend to teachers in secondary education as well. The program for teachers was designed to culminate for the teacher in a masters degree and certification to teach. The internships were coordinated through Mobilization for Youth (MYF), a demonstration project for the control of delinquency in the Lower East Side, Manhattan Borough, New York City. The program was revised and improved in 1966-67 with special approval of the New York State Department of Education.

The Hunter College Institute in 1965 was another effort to prepare elementary school teachers who were working in inner city slum areas. The training grant which supported this institute was made through the National Defense Education Act. Provisions for improving elementary education were the main purposes of the Institute. New York City's inner core, and the immediate large borough areas surrounding it, was the area concerned in the institute program. Some recommendations for teachers which grew out of the institute were *sensitivity* and *understanding*. To become more sensitive, teachers would need to learn to know themselves better, accept the child as he is, and learn more about how the disadvantaged youth learns. Further, teachers would, by accepting the child as he is, have faith in the child's potential. For the school, it was recommended that provisions be made for teachers' use of more relevant and meaningful teaching media and materials in the curriculum. All such teacher education projects mention essentially the same general

needs of teachers: (1) understanding the community and the school and (2) actual classroom and field experiences before the teaching assignment.

Another interesting development is the proposed "Master's Degree Program for the Preparation of Teachers of Disadvantaged Youth." This program was developed by a distinguished group of educators under a grant from the U.S. Office of Education (13:167-241). John R. O'Brian, Rutgers University, under Grant OE 6-85047 developed the guidelines for establishing a master's degree program for teachers of disadvantaged youth. This project brought together distinguished persons as members of the "Curriculum Committee." Although the assignment was to develop a master's degree program it seems rather that the committee developed a series of courses or field experiences which would be appropriate in a master's degree program. The main features of the program would be courses or experiences designated as follows:

1. The Curriculum
2. Social Psychology of the Disadvantaged
3. Urban Society
4. Field Experience
5. Learning, Development and Measurement
6. Educational Process for Teaching the Disadvantaged Youth
7. Educational Practicum for Teaching Disadvantaged Youth
8. Professional Issues

The above courses, developed for the master's degree program, were fully outlined and implemented with rather comprehensive bibliographies.

The above programs and others which deal specifically with teacher preparation frequently mention industrial and technical fields. There is a great need for specific research and demonstration projects to develop training programs for industrial arts teachers. The Industrial Education Department at Wayne State University has been conducting a study to determine those teaching practices in industrial education which might prevent or deter untimely dropouts. The University of Illinois has already made its final report (5) on an experimental project designed to prepare industrial education teachers to work with dropout-

prone students. The extent to which we need such programs can be understood readily when we consider the statement in the Illinois report: "To our knowledge, this was the first program in the nation to prepare industrial education teachers to work specifically with dropout-prone students." This is a vital area where industrial arts teacher educators should take action. Higher education programs should be developed which would provide specialized training. This training should be aimed at providing teachers with the attitudes and skills which will keep them from feeling inadequate, and in turn frustrated. It should keep many from withdrawing and seeking more attractive appointments in middle-class schools.

Dealing with Today's Problem

Industrial arts teachers working with disadvantaged children, either in the inner city or rural slum situation, should press for elementary school industrial arts. The team teaching approach at all levels, but more particularly there, would provide for a more dynamic and functional involvement. The "now" situation demands the beginnings of a transition based on attainable and immediate goals. One of the most immediate goals should be to use any available method to keep the disadvantaged child in school until he has achieved skills to facilitate a timely dropout. Many will never get into high school, much less graduate, if the elementary program has not retained him. Getting a high school diploma simply because one has withstood the educational barrage for a certain amount of time is not an interpretation of the retention goal. Rather, it might be timely and proper for some children to drop out before the completion of high school. However, employers today believe that the diploma represents a nebulous type of guarantee of character and ability which qualifies the recipient as one who is ready for employment. Recent innovative experiments by some employers have falsified the "diploma concept," but if we are realistic, we must recognize that the high school diploma has become the criterion of employability. Frequently, and in instances unjustly, the disadvantaged child has been turned away from vestibule employment because of his failure to complete high school. Interestingly enough, it is this diploma concept which the disadvantaged child often interprets as a sham. He sees the school as an evil trap which de-

mands his time in a frustrating attempt to rationalize its ulti-
mate value. His motivation is lost; his survival and patience
becomes of short duration.

Along with the basic goal of keeping these students in
school, disadvantaged youth should be motivated into setting
some realistic goals, both personal and vocational: growth in
achievement, development of positive attitudes and improvement
in aspirational patterns are but a few. The development of an
understanding of life inside, as well as outside, of slum areas
will help the teacher assist children to establish more realistic
goals. Essential is the learning about all facets of American life
and its people, diversified as they are by heredity, occupations
and training. Gaining understanding about all types of occupa-
tions, and the types of experiences and training required to func-
tion in them successfully, is essential for deprived children to
establish realistic personal goals.

The environment for teaching, the aids and devices are very
important for proper motivation and learning. Within the frame-
work of any educational institution, we simply cannot offer all
things to all students. The flexibility of any laboratory, shop or
classroom is limited. Realistically, the program of education
should make arrangements for accommodating as many children
as possible with achievement grouping regardless of small class
size. Often it seems impossible to implement any innovative pro-
gram because of lack of facilities and teaching staff. New
teaching techniques frequently get lost by the wayside for lack
of time and manpower. Curriculum planning, implementation
and change require a larger teaching force for disadvantaged
youth. Desirable teaching and follow-up practices take more time
with deprived youth. If this cannot be allowed, there will be
many failures. The teacher of the disadvantaged must be a master
at recognizing his own, as well as his students' failures, and be
able to rise above them by trying again, using new materials and
methods as necessary. His use of space should not be restricted
unduly. Rooms, shops and laboratories should be very flexible
for diversified activities and instructional media use.

Just as there are practical problems which cannot be over-
come without special environmental conditions, there are many
personal and emotional problems of the disadvantaged child
which need the attention of psychologists or psychiatrists. We

must realize that he may have a peculiar set of values and norms. Being alienated to society he may feel justified in acting in an antisocial manner. He may be expected to "act up" in the school room, which to him represents society. If any progress has been made toward understanding the emotional make-up of these children, it is in coming to realize how truly important teachers are to them. The book, *The Drop-Outs*, observed that teachers underestimate the importance of their own influence on the lives of potential dropouts (8: 183). It was pointed out further that one great issue of genuine concern among dropout-prone students was whether or not they were liked by their teachers. This would be especially true of industrial arts teachers, where such close pupil-teacher relationships are demanded. All teachers of disadvantaged youth should make sure that their students are moving toward a reduction of mental anxieties and are getting psychological problems resolved.

Teachers should expect every disadvantaged child to accomplish something for which reinforcement or a reward is received. Many times the only reinforcement or reward needed by these students will come from the teacher. Again, the recognition by the teacher of accomplishment is as much reinforcement or reward as that student seeks. The teacher has a great influence on the lives and attitudes of students. Students who have identified themselves with their teacher's approval achieve more. The common habit of recognizing too little would handicap the teacher in expanding the rapport with his clients among the disadvantaged.

Blanket approval to undereducate in innercity schools and in "rural slums" is inexcusable. If the teacher takes the easier way out in the classroom by expecting little or nothing from students, he will have been most ineffective and will have registered a rejection for his students which is fully recognized by them. In identifying some general principles which might direct teachers to some degree of success in classrooms, shops and laboratories, the following are suggested: (1) recognize what can and cannot be accomplished within the educational framework, (2) develop an understanding of the emotional make-up of disadvantaged children in your class, (3) realize your importance to these children as they relate to you in their learning experiences, (4) accept failure and be able to accept success and reward it

properly and (5) be sensitive to the individual student's needs. Patience, sincerity, flexibility and a sense of humor are, of course, personal characteristics needed by all teachers regardless of their assignments.

As a part of a composite portrayal of an ideal teacher for the disadvantaged, Miriam Goldberg cited some of this teacher's characteristics. Such a teacher, according to Goldberg, should be a mature person who has great respect for his difficult and apparent unteachable students. Such a teacher indicates his respect for these students by setting high but attainable expectations, by his firmness, his honesty and certainly by his warm personal feelings for each student (13: 475).

Teachers of the disadvantaged should try to develop a meaningful relevant curriculum and present this curriculum in the most effective way possible. Planning a relevant and functional curriculum is handled much like the weather, everyone talks about it and no one does much about it! There are some observations which could be made about curriculum planning for the disadvantaged. Careful consideration should be given to the general potential of these students and their occupational probabilities. This coupled with what we know about disadvantaged persons' reasons for leaving school should give us a fairly broad base from which to work. The three reasons given most often for students dropping out of school are: (1) disinterest in school, (3) no relationship between school and the world outside and (3) poor achievement in regular school work. An interesting curriculum, one which is relevant to their needs and which allows for achievement is the curriculum needed to deny most students a reason for dropping out. Earlier the learning process among these students was discussed. Learning by doing requires concrete experiences. All sorts of activity should be planned. It's not enough to have teacher activity alone; all should become involved in activity in an orchestrated way where each student makes a contribution to the whole. This activity allows all to handle the actual things they study. The basis of the curriculum must be physical involvement.

Arnold Buchheimer clarifies this some by observing that very often there is too little time spent on actual concrete involvement with some activity (he refers to taking apart a motor or handling tools). Of great interest here is that the

Job Corps people felt that their most successful experiences were those in which the physical activity proceeds the cerebral. (13: 74)

Activity alone will have to be tied to some larger, more directive goal, perhaps a "project," either of the group or individual type. From the diary of a teacher-in-training working with dropout-prone boys in the Illinois project, the following is noted:

I am finding difficulty maintaining interest in lab without "the making of something." These students seem to need to make something. They do not see value in just learning to use a tool or machine merely to learn all of the possible operations it would perform. (5: 86)

Another use of the project which gives it unlimited value for these students is that a project can be designed, planned and programmed in learning difficulty to assure that the student will achieve some successes while working toward its completion. Some success and personal reinforcement is necessary for any motivation to take place. For many youth the project will have been the only personal vehicle or means for achieving success in any assignment ever attempted. Just keeping students busy will not provide a solution to one of the basic problems of disadvantaged youth. Even though interested and provided with some level of success, the student must come to realize that what he is doing is relevant to life now and in the future. "What is this going to do for me?" is the question posed most often. The successful project surely will not be a common one for every boy in the class. It is conceivable that at times the majority of the class would be working on different projects and jobs entirely. Instruction might well become highly individualized as the teacher "bends" to meet individual interests and needs.

Group endeavor involving designing, manufacturing, distributing, selling and servicing products seems to be an appropriate type of project. This approach would teach a close relationship between school learning experiences and the outside world of work in a captalistic society. The group project work would require very flexible laboratory use and very flexible floor layout of equipment and machines. It would require group planning through the democratic process of decision-making. Such group activity would achieve much in developing a more wholesome "self-concept." Decision making through democratic

processes and physical change effected in laboratories would be a new experience for most disadvantaged youth. Self-confidence would be developed and respected. Industrial arts assignments must be flexible and diversified for these kinds of classroom laboratory experiences to accomodate disadvantaged students. When a student achieves a level of success and is ready to proceed to the next higher level, it would be possible to keep him interested and motivated if once he could be given a challenging assignment in a group or individual project. It should be kept in mind that although all students would not be working on the same thing, all would be working together under a mutually acceptable industrial-type organization. The purpose would be to expose them to all sorts of activity while simulating employment and group activity, such as found within the framework of a regular working schedule typical of industry, employing correct working habits, while using the typical tools of industry. Although individual project work should not be overlooked, group planning and decision making is essential to this type of class participation.

Industrial arts teachers are not social workers or psychiatrists. They cannot correct environmental situations which have made the child what he is. At best, they can hope to offer him some interesting material, meaningful to him, which will allow him some level of achievement to motivate him to stay in school. Furthermore, they can relate their subject matter and media to all fundamental common learnings giving meaning and understanding to otherwise abstract ideas. To help disadvantaged youth establish realistic occupational goals, good work habits and good attitudes, and familiarize them with the world of industry — these are realistic and appropriate goals that could be accomplished with industrial arts. Many elementary and secondary schools which house programs for the disadvantaged offer remedial work largely. Industrial arts may be of value in this, but its greatest contribution could be made in preventive programs.

The best technique is the one that works best. Among disadvantaged students there will be few instances of uniform achievement within groups or classes. Although it may be impossible to establish a specific pattern of a successful teacher, it has been observed that he is quite flexible. This flexibility

identifies him. His shifting from one to another of a variety of methods is the thing which makes his pattern less predictable. His basic teaching technique is to match the method or technique to the student's learning speed and style. The disadvantaged child has a learning style which is generally nonverbal. To employ teaching techniques which enable him to become a participant rather than an observer would be desirable. To plan assignments and activities which are out of the realm of hypothesis and in the realm of happening would be better than the reverse. In other words, every assignment must have purpose; every activity must have some meaning within the student's concept of his world. Motivation for these students will be possible only when their efforts are reinforced as soon as possible. Bruce Tuckman feels that there are some specific ways in which this can be accomplished. Quickly scoring examinations, providing immediate feedback relating to student's performance and continually trying to relate school experiences to real life are usually found to be effective ways for providing reinforcement (10: 11).

Although the Illinois Project was designed to prepare vocational-technical teachers to work with disadvantaged youth, its findings seem very appropriate for consideration here. The following list of rather unique methods was taken from among those which the project considered valuable.

1. Activities should vary from normal classroom activties. (Here it was stressed that lecture was the least successful teaching technique.)

2. Activities should be developed so that the student takes a part. (Aside from regular projects, this may include such things as operating audio-visual equipment.)

3. Present time orientation was an almost universal recommendation. (Basically, in connection with demonstrations on equipment or tools just prior to use.)

4. Being prepared was noted as imperative.

5. Well-structured presentation of all materials.

6. Use a large variety of methods, aids and gimmicks. (Include such things as playing checkers on a board made in class, mass production products, etc.)

7. Units of instruction should be flexible.

8. Teamwork within the group should be encouraged.

9. Units of instruction should be designed around families of jobs in prevocational courses.

10. Technology in these units should be limited, applicable, not too difficult and concrete rather than abstract.

11. Activities should stress practice of needed skills. Assignments should have purpose and meaning.

12. The student-teacher relationships should be positive and complementary. The teacher should avoid pressuring the student, but should expect accuracy and hopefully develop pride of workmanship. To accomplish this, the activity (1) should be so designed that the student is assured of success, (2) should be challenging but (3) should avoid tedious handwork such as extensive sanding, forming metal or polishing.

13. Films were effective in giving a broader and more real picture of on-the-job work and acquainted the student with industrial process and activities.

14. Film strips were used and generally accepted but long sessions should be avoided.

15. Field trips were quite successful in showing the student on-the-job activities and working conditions. If possible they should be dramatic in order to get the student interested. Discussion following the field trip is an excellent opportunity to learn about wages, entry jobs, necessary training, etc. (5: 35)

In a concluding paragraph summarizing these teaching methods the following was generalized:

In conclusion, it appears that learning units should have the following: structure; variety in presentation and activities; student involvement; present orientation; flexibility; reinforcement; enrichment through films, field trips, displays and any other available audio-visual materials; gimmicks; and understanding teachers. (5: 35)

In the final analysis, the last two words of the above quotation are the real key to success in a classroom of disadvantaged children. The understanding teacher is still the most effective ingredient in the classroom. It has long been recognized that the close pupil-teacher relationship of mutual respect is strongly rooted in industrial arts laboratories. Cultivating these relationships will bear fruit in the success teachers of industrial arts seek.

In this society, educational institutions and all of those who are a part of them are confronted with the responsibility of providing *all* (not some) youth with the skills necessary for leading fulfilling lives. Truly this great task has no place for prejudices but rather a place for willingness to attempt innovative approaches to methods in the educational process. There are no substitutes for good educational programs, but history notes

that a good program for one age or group is not necessarily a good program for another age or group. Perhaps it is now time to consider a new type of education for industrial arts teachers to include experiences with the "today" society.

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The Industrial Families Included in Industrial Arts

WILLIS E. RAY

Preceding chapters have dealt with the nature of the problem of disadvantaged youth, the identification of the disadvantaged, the special needs of such youth, and the increased demands that must be made on teacher preparation programs. The question of content or subject matter of industrial arts for this pupil population and related curriculum questions will be addressed in this chapter.

The Curriculum Development Task

Many volumes have been written regarding the curriculum development process. No practical purpose will be served by comparing and contrasting the several points of view of experts in general curriculum theory. However, for purposes of presentation and discussion, the Taba model (11: 12) will be presented here and related to the general theme of this yearbook.

Taba has enumerated seven steps in the general curriculum development process. These steps provide a way of orderly thinking about curriculum development:

Step 1   Diagnosis of needs
Step 2   Formulation of objectives
Step 3   Selection of content
Step 4   Organization of content
Step 5   Selection of learning experiences
Step 6   Organization of learning experiences
Step 7   Determination of what to evaluate and of the ways and means of doing it.

The first step is important since a diagnosis of special needs of a particular pupil population is fundamental to success in the curriculum development process; hence the first three

chapters of this yearbook. The second step is closely related to and dependent upon the first. General objectives must be formulated that reflect the nature of the school program required to satisfy the special needs of the pupil population in question. This chapter will consider questions closely related to the third step, the selection of content. To a degree the remaining chapters of this yearbook will address Steps 4, 5, and 6. The last step in the Taba model, evaluation, is not a direct concern of this yearbook; however, the reader should consult the 16th Yearbook of the American Council on Industrial Arts Teacher Education (2). Although it dealt with evaluation of industrial arts programs, it did not attempt to differentiate between industrial arts for the average children in our society and the disadvantaged youth therein.

The presentation here will focus upon the source and nature of the content of industrial arts. Once the content boundaries and elements are defined and described, many programs of study can be designed. Programs may be based upon the nature of the learner (disadvantaged, gifted, physically handicapped, normal, etc.), the level of instruction (elementary, junior high, senior high, collegiate, or adult) and/or the purpose of the instruction (general or "vocational").

Confusion with the Terms "Industry" and "Technology"

There would be little argument between and among the members of the industrial arts profession regarding such statements as "Industry is the source of content for industrial arts," or "Industrial arts is a study of the technology of industry." Such statements are made often at professional meetings and appear frequently in the literature of the field. Yet there is lacking a precision of communication. There seems to be little inclination to define terms, and from precise definition, delineate a body of knowledge as the source of content for industrial arts. On the contrary, the terms "industry" and "technology" are used very loosely, seldom defined and are often used as synonyms. One of the better discussions regarding industry and technology as sources of content for industrial arts may be found in the 17th Yearbook of American Council on Industrial Arts Teacher Education (1: 15-30). Industry is rather well defined but the definition of technology lacks the same precision.

The Nature of Industry

The term "industry" has many meanings. It may be used to mean earnest, steady effort in any endeavor. Beyond this very broad usage, it is used as it may be equated with the terms "business" or "commerce." It is also being used more often in connection with agriculture. Industry is a term commonly used as a noun with an accompanying adjective. Examples are: banking industry, communications industry, sugar beet industry, trucking industry, cattle industry, steel industry, fishing industry, garment and apparel industry, entertainment industry, building industry, insurance industry, mining industry and the hotel and motel industry.

Are these the kinds of industries that are in the minds of industrial arts professionals as they discuss industry as a source of content for industrial arts? It is believed by this writer that many of the "industries" mentioned above would be eliminated quickly from any further discussion regarding industrial arts content. But why are some eliminated from discussion? On what bases are some industries considered as sources of industrial arts content while others are not?

The answers to these questions would help clear up the problem of communication caused by lack of precision in the use of terms. Let us examine some possible interpretations of the term "industry."

If one considers the term in its broadest meaning — earnest, steady effort in any endeavor — then industry could be considered as common with the home, playground, farm, mine, factory, church, school, store or governmental office. All persons in each setting are involved in earnest, steady effort toward the accomplishment of their goals. (See Figure 1.)

More commonly, "industry" is considered to be limited to a usage related to economic activity, that is, the production of goods and services. In this instance, "industry" would be synonymous with "economy." It is precisely in this sense that the *Standard Industrial Classification Manual* was conceived and developed — to classify establishments by type of economic activity:

The Classification is intended to cover the entire field of economic activities: agriculture, forestry, and fisheries; mining; construction; manufacturing; transportation, communication, electric, gas, and sanitary ser-

vices; wholesale and retail trade; finance, insurance, and real estate; services; and government. (4: 1)

Note that in this important government document, *industrial* classification is equated with *economic* classification. All phases
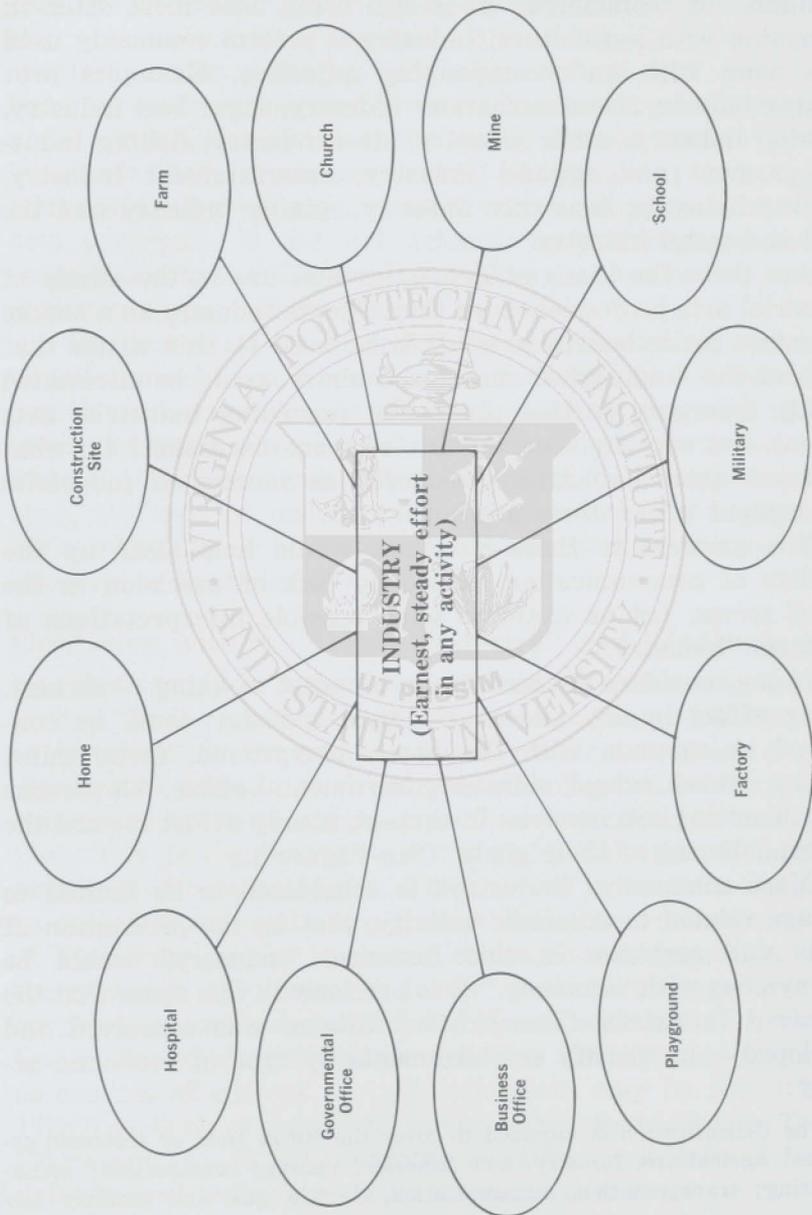
Figure 1.

of the economy are considered industry. Hence industry could be used interchangeably with business, commerce, agriculture, services, and other common, similar terms. (See Figure 2.)
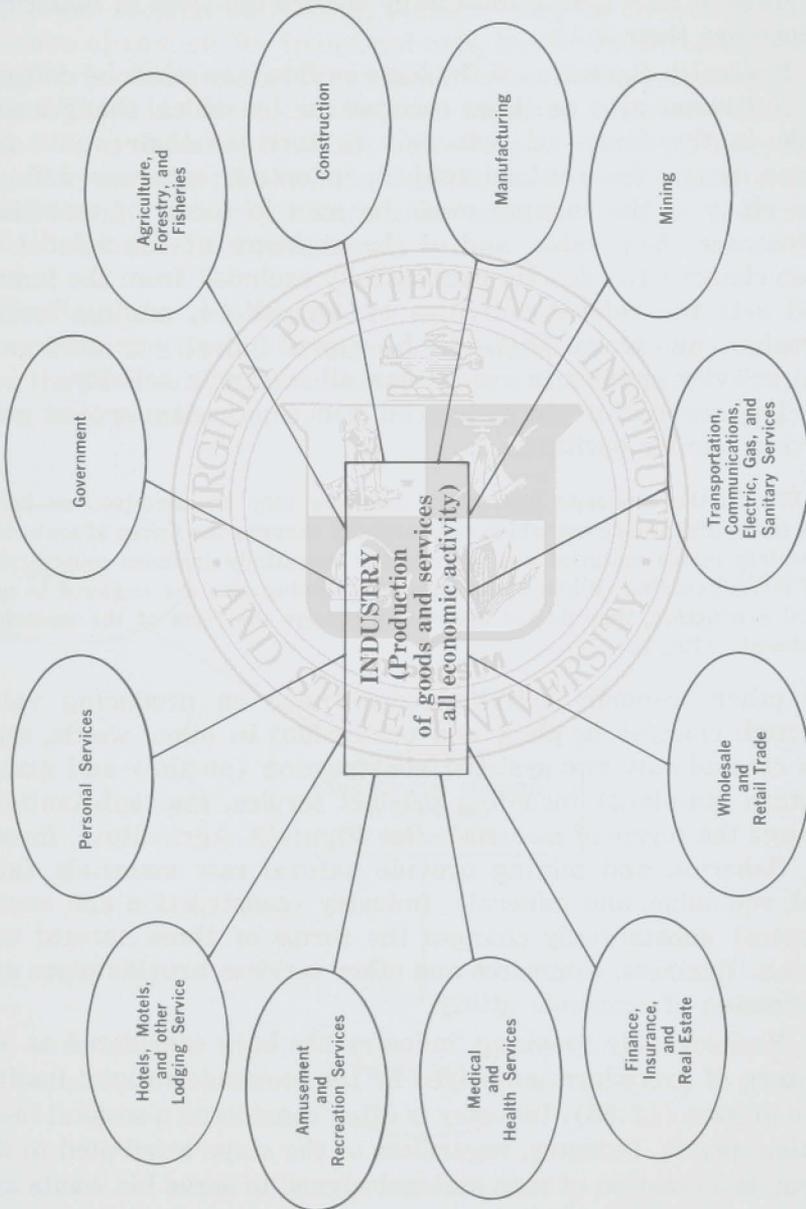
Figure 2.

In a narrower sense yet, industry could be conceived and defined as a subelement of the total economic system. Economic value is gained through changes in form, place, time, and possession. The term "industry" could be limited to those economic activities of man that substantially change the *form* of materials to increase their value.

Frederick Bonser used the term in this way when he defined the industrial arts as those occupations by which changes are made in the forms of materials to increase their value for human usage. As a school subject, industrial arts was defined as a study of the changes made by man in forms of materials to increase their value, and of the problems of life related to those changes (3: 5). He purposefully excluded from the industrial arts the related activities of agriculture, mining, transportation, and trade. Therefore he viewed industry as an organized activity smaller in scope than all economic activity.

The rationale of the Industrial Arts Curriculum project puts forth a similar position:

> Within the economic institution, *industry* may be conceived as being that institutional element which substantially changes the forms of materials to satisfy man's material wants. Industry essentially includes construction and manufacturing. While agriculture and mining also are engaged in material production, they do not essentially change the form of the materials produced. (12: 72)

All other economic activity concentrates on producing value through changes in place and possession. In other words, man has created only two systems, construction (on-site) and manufacture (in-plant) including product service, that substantially change the forms of materials. See Figure 3. Agriculture, forestry, fisheries, and mining provide natural raw materials (animal, vegetable, and mineral). Industry (construction and manufacture) substantially changes the forms of these natural materials. Business, commerce and other services provide place and possession of economic utility.

Sociologically speaking, industry has been considered as one pattern of procedures employed by the economic societal institution of man (12:68). Industry is often considered a societal institution, *per se*. Industry, regardless of the scope attributed to the term, is a creation of man and is designed to serve his wants and

needs. However, it is insufficient to define industry merely as a societal institution without carefully delineating its scope and elements.

As a societal institution, or as one pattern of procedures of a larger societal institution, industry may be considered as the source of content for industrial arts, but it cannot be considered the body of knowledge from which industrial arts draws its content. There is a difference between industry (whatever its scope) and the systematized, codified knowledge (industrial technology) used by persons who work in it. Industrial knowledge (industrial technology) and other knowledge used in industry will be described later in this chapter.

The Families of Industry

With the preceding discussion behind us, we can turn now to the theme of this chapter. What are the "families" of industry that provide the source of content for industrial arts? The
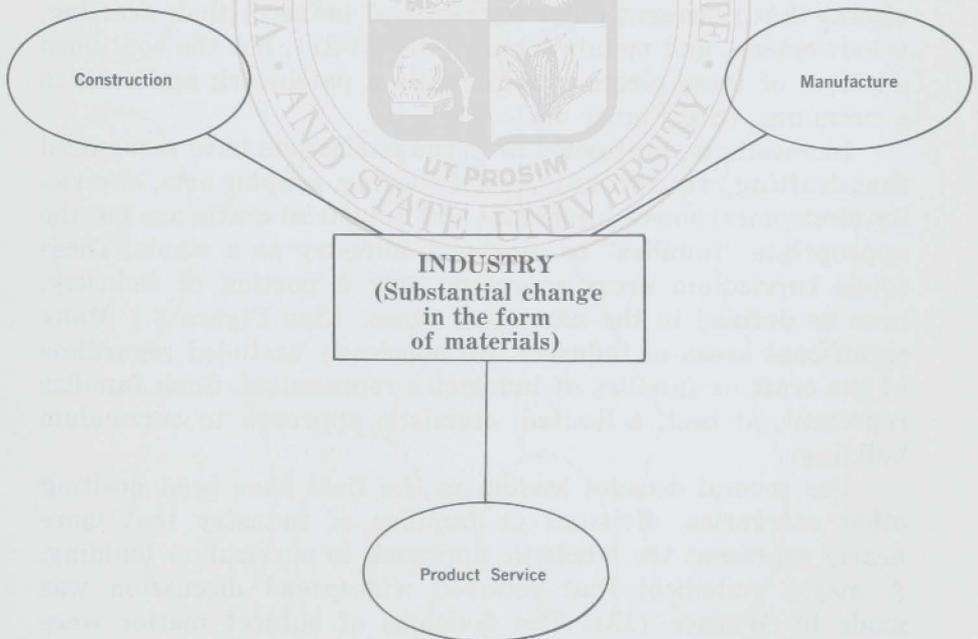
Figure 3.

reader should recognize that the answer to this question depends upon how industry is defined and how the scope and elements of industry are conceived. In addition, an answer to this question should provide some guidelines for the acceptance or rejection, for example, of the banking industry, the entertainment industry or the livestock industry as sources of content for industrial arts.

Historically, industry has not been carefully defined or structured. In general, it has not been considered in any wholistic sense but rather it has been represented in industrial arts by small bits and pieces. In large measure, industrial arts programs in schools today are composed of drafting, woodworking, and metalworking (10:30). The subject matter representing these "pieces" of industry has been selected from an analysis of what the draftsman (principally machine draftsman) must know and be able to do, what the woodworker (patternmaker, cabinetmaker or carpenter) must know and be able to do, or what the metalworker (machinist, welder, founder, sheet metalworker or jeweler) must know and be able to do. Slightly over one-fourth of the total industrial arts enrollments in the United States are in classes that represent other segments of industry than drafting, woodworking, and metalworking (10: 23-27), but the continued addition of these pieces provides only a patchwork approach to curriculum. (See Figure 4.)

Increasingly, professionals in industrial arts have recognized that drafting, woodworking, metalworking, graphic arts, electricity-electronics, power mechanics and industrial crafts are not the appropriate "families" to represent industry as a whole. These seven curriculum areas represent only a portion of industry, even as defined in the narrowest sense. (See Figure 3.) Many significant areas of industry are hopelessly excluded regardless of the craft or families of industries represented. Such families represent, at best, a limited, atomistic approach to curriculum building.

For several decades leaders in the field have been positing other categories, divisions or families of industry that more nearly represent the wholistic approach to curriculum building. A major statement that received widespread discussion was made by Warner (13). The divisions of subject matter were projected as power, transportation, manufacture, construction, communication and management. The ideas presented in War-

ner's *A Curriculum to Reflect Technology* have influenced the
writings of most contemporary curriculum theorists in industrial
arts.
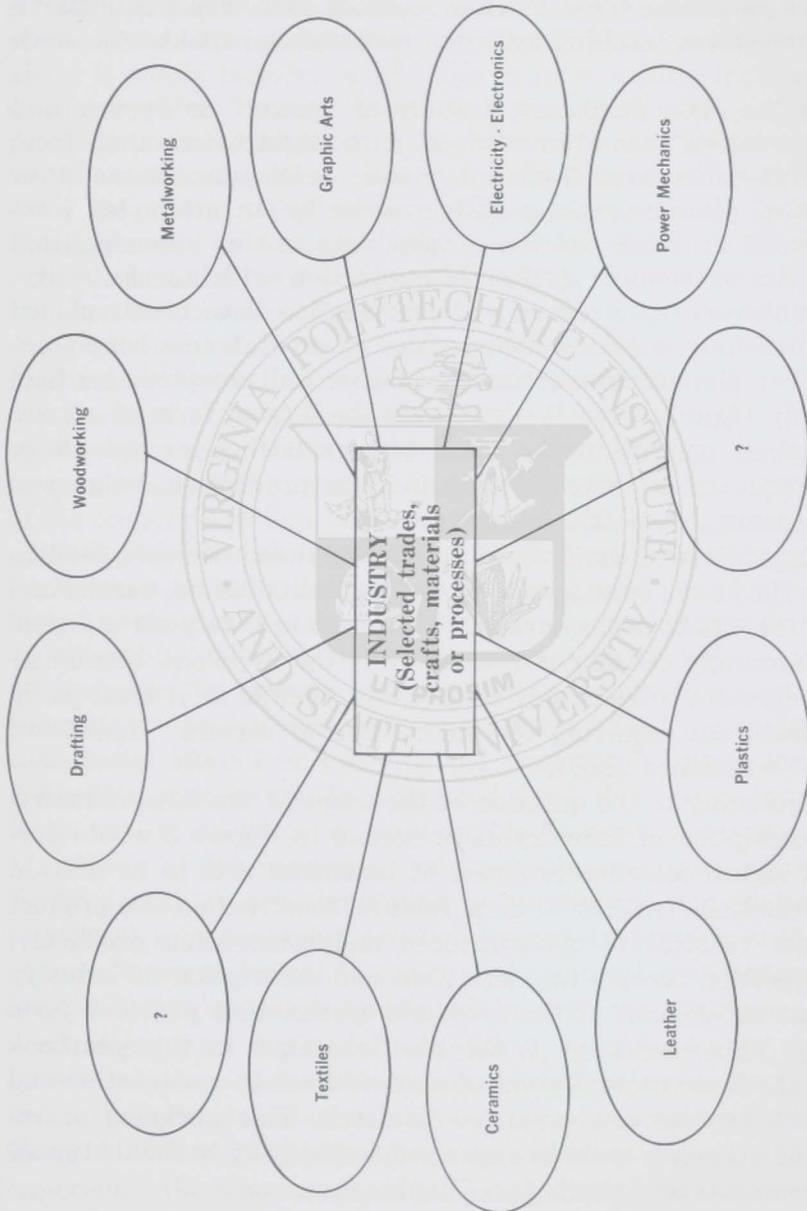
Figure 4.

Because of this influence, a limited number of programs of study were developed including power, power and transportation, communication, construction and manufacture. These occur in widely scattered schools throughout the nation, with no special pattern governing the media and methods used. There is a dearth of commercial teaching-learning materials available for such classes.

In too many instances, a study of "power" or "power and transportation" has often evolved, with slight broadening, from a traditional automechanics or power mechanics course. Programs of communications have evolved by an attempted integration of drafting and the graphic arts and/or a combination of electro-mechanical devices in conjuction with an electricity-electronics course. Programs of construction have been included by broadening a woodworking class to cover frame home construction. Manufacturing has been rather well accepted as a field of study (family), but it often takes the limited form of a mass production project in the woodshop, metalshop or printshop. This "production" often ignores the true production design and engineering practices used by industry.

Regardless of the level of success of these attempts, leaders in the field have been searching for new "cuts" of the curriculum "pie." This is to be encouraged. The problem is to posit a logical and internally consistent rationale for the divisions (families) that represent a true study of industry, limited as it must be by circumstances requiring the elimination of certain "significant areas" mentioned above.

Returning to the question of the scope of the term industry, the description of industry as presented in Figure 3 would permit a logical selective program of industrial arts to be derived from the basic families of manufacture, construction and product services (service to manufactured and constructed products). This position accepts the definition and description of industry as that subelement of the economic system that provides *form* utility. This essentially is the position taken in this yearbook since the three content areas of manufacturing, construction and product services are expanded in detail. This abridged or restricted approach could be organized realistically in flexible space environments as described in Chapter Four.

One should not reject the above position as being too narrow (note that manufacture, construction and product service is much broader than the great majority of present programs). The next logical facet of the industrial complex would reach out to include additional families that cover the totality of the economic system that provides man with all of his goods and services. It would include, in addition to *form* utility, increases in economic value through *place* and *possession* utility. Such a definition would embrace, among others, power, transportation and communication as families from which industrial arts would draw its content. Illustrated in Figure 2, the reader will note that industrial arts would draw its content also from the banking industry, the hotel and motel industry, the fishing industry, the medical services industry, the real estate industry, the wholesale and retail trade industry, the insurance industry, the personal services industry, the entertainment industry and others.

Earlier in this chapter it was suggested that many persons would reject some of these industries as being absurd as sources of industrial arts content. If they would reject some categories of the economic system, but accept others within the system, upon what criteria is such a selection made? Are the criteria applied based upon tradition? Are the criteria applied based upon the use of mechanical devices? Are the criteria based upon the close "relationship" that exists between some elements but not among others? Are the criteria based upon the assumption that some elements of the economic system are more "like" industrial arts than social studies or other school programs? Unless logically defensible criteria can be presented (and the author is unable to do so), it would seem indefensible to select some segments (families) of the economic system to the exclusion of others. Granted that all are significant in our society and that many industrial arts personnel are not trained to provide such programs, it seems logical to enlist other subject matter teachers into the team approach mentioned in previous chapters.

Industry, as depicted in Figure 1, would provide even a greater number of families from which to select content. Most industrial arts personnel would not give such a scheme a second thought. However, if education is to be based, in part, upon life experience, the school as a whole (not just industrial arts) should

give some consideration to "industry" in its broadest meaning. Here, in addition to the above paragraph, the entire program for disadvantaged youth becomes involved. This in turn demands the participation of all teaching and guidance personnel in this program.

The Nature of Technology

An attempt was made above to distinguish between industry as a source of content and industrial technology as a body of knowledge. The point was made that industry (however narrowly or broadly defined) involves purposeful and productive activity of man to serve his wants and needs. Industry may be considered to be a source of content, but the content for organized study must be a structured, systematized and codified body of knowledge. Industry, as a societal institution or as one pattern of procedures of a larger, more encompassing societal institution, cannot be equated with a body of knowledge. It is a place where industrial knowledge, and indeed all of the other knowledge of man, is brought to bear in solving industrial problems.

Let us examine the several meanings of the term "technology." Literally the term means the science (-ology) of "technics" or techniques. In the broadest sense, technology could apply equally well to the knowledge of performing a military skirmish, teaching, healing the sick, raising chickens, designing a book cover, baking bread or building an automated materials handling device. Over the years, however, the term has acquired a restricted meaning associated with mechanical devices (hardware) or mechanical processes.

Galbraith, in *The New Industrial State,* defines technology in terms of applying systematically the accumulation of organized scientific knowledge to practical tasks. He recognizes that the consequence, from the economical point of view, is that it forces the ramification of a job into subdivisions which can then have organized knowledge applied appropriately ((7: 12). To make the point that the term "technology" need not be restricted to mechanical things, Galbraith further suggests that the subdivision of jobs occurs in the professions, businesses, construction corporations and in domestic chores. It would occur in any as-

signment which includes a wide spectrum of scientific application (7: 13).

To further support the contention that the term "technology" in education has a broader meaning than the often quoted (and very narrowly interpreted) phrase "the science of the industrial arts," Robert Gagne has proposed that the term "technology" has a very broad connotation in the term "educational technology." It is much more than hardware or the use of machines in teaching (8: 6). Gagne was speaking of educational technology rather than industrial technology, the science of arts and industries. His discussion of technology here was one in which he pointed out the disparity between the hardware of teaching and a systematic organization of techniques based on accumulated knowledge in handling educational systems. His technology was more particularly the "engineering" of education. In developing further his thesis, Gagne states that many disciplines within the broad fields of physical science, social science, organizational science and the science of designing conditions for learning, such as psychology, are involved. Educational technology to him was an organizational scheme involving research design and development (8: 6). Again, this may be interpreted as the science of techniques in education. To ignore the broader interpretation in this discussion would leave the *praxis* in industrial arts inadequate, especially for disadvantaged youth.

Technology may be equated with praxiology (9) if technology is conceived broadly and not narrowly interpreted as techniques related to mechanical devices or mechanical processes. It is in this broadest sense of the word that technology has been conceived as a major *domain* of man's knowledge by the Industrial Arts Curriculum Project (12: 1-22, 77-84).

The generic term, technology, is something very broad in scope. The taxonomy would include a wide spectrum of classifications of activity ranging from a limited or narrow amount of knowledge and skills to an extremely broad and extensive number of knowledges and skills. Within this would be located many aptitude levels for learners at different stages. Particularly for disadvantaged children, the wide spectrum of action, practice, method, technique and procedure should be investigated for the selection and organization of content and learning experiences.

Industrial Technology: The Body of Knowledge from which Industrial Arts Draws Its Content

The term technology may be conceived, then, to be the ordered knowledge of expert or efficient action, practice, method, technique, or procedure. To be expert or efficient is to be skillful; so technology is concerned with the organized knowledge of skillful action. Man is a very active animal. Therefore, he has many different kinds of technologies.

Of central interest to our discussion here would be the body of knowledge of *industrial* technology. Industry has been defined as one pattern of action and/or a societal institution. Industrial technology would be that ordered, classified, codified knowledge of efficient action of the *families of industry* conceived to be the source of industrial arts content.

If the reader wishes to define industry as depicted in Figure 1, then industrial technology would involve that ordered knowledge of technique on the farm, in the home, in the church, on the playground, and others. If the more restricted definition of industry is preferred, as shown in Figure 2, the industrial technology would involve that knowledge of technique in personal services, entertainment, wholesale and retail trade, communication, transportation, manufacturing, and others. If industry is conceived to be that sublement of the economic institution that substantially changes the forms of materials to increase their value, as illustrated in Figure 3, then industrial technology would involve that ordered knowledge of technique of manufacture, construction and product service. Chapters six, seven and eight actually follow the approach indicated in Figure 3. No attempt has been made to outline any more than could be carried on by the industrial-arts-trained personnel. After some thought and subsequent action has been given to this step, and after some significant, measured success has been attained in this approach, a broadening of the scope might well be considered.

It might be difficult to make a case for industrial technology as an intellectual discipline. As an organized field of knowledge, it is in its infancy. It does, however, meet many of the criteria that have been established for an intellectual discipline (1: 22-25). Industrial technology has a specific scope, domain or area of investigation (depending upon the definition of industry).

Attempts have been made to develop a conceptual structure of technology, industry, or industrial technology (5: 41-54; 6: 60-72; 12: 148-164). Industrial technology has a known history which has been established (1: 31-129, 209-234). Further, industrial technology has a unique method of inquiry (1: 27). Since technology, as a major domain of man's knowledge, and industrial technology, as one potential acedemic discipline within that domain, are deeply rooted in the pragmatism of Western culture, the method of inquiry might be characterized by the constant search for a "better way of doing."

The Need for Focus

Two important considerations must be held paramount when curriculum theorists ponder the question of content for industrial arts. First, curriculum planners should realize that all subjects of the school, collectively, perform the acculturation process of education. Hence, industrial arts should attempt to search out that content which is unique and different from that available in other subjects in the school program. This statement should not be interpreted as opposition to appropriate correlation and integration of subject fields; it does call for careful delineation of jurisdiction regarding content. Industrial arts has often suffered because it has presented, as its content, that content more appropriately taught in the physical sciences or social studies.

Second, curriculum planners must note the tremendous motivating value of laboratory *activity*. Industrial technology, by its very definition, should focus upon the study of efficient actions within the industrial setting. Properly developed, programs of industrial arts can make maximum use of laboratory activity while reinforcing the conceptual structure of the discipline of industrial technology.

Returning again to the scope of industry and the families chosen to be explicated in this yearbook (manufacture, construction and product service), some content should be selected to take on central significance, and some content should be reserved for secondary, peripheral significance. Accepting the technologies of manufacture, construction and product service as central, other closely related technologies should receive appropriate attention. Among these secondary sources should be listed agri-

cultural technology, mining technology, communication technology, transportation technology, accounting technology and marketing or distribution technology. In addition, other nontechnical fields such as history, physical science and mathematics should be attended to as they illuminate the central focus, industrial technology. Again, inter-disciplinary, team-teaching efforts would enhance the latter, especially when offered to disadvantaged youth.

Elements of Industrial Technology

Regardless of the scope of industry (and the attendant families) held philosophically and conceptually by the reader, there are two major dimensions of technological knowledge that should be represented in any attempt to structure content for industrial arts. These are the management and production dimensions.

All human activity, whether broadly or narrowly conceived, involves actions of management and actions of production. These actions affect people and they affect things (12: 148-153). If a broad concept of industry is held by the reader, "production" could be conceived of as a well patient (medical services), a happy lodger (hotel and motel services), an effective message (communication services), a satisfied traveler (transportation services) or a skillfully produced automobile or telephone (manufacturing). Management is so fundamental to successful and efficient human activity that its elements should be included in a study of industrial technology, regardless of its scope.

Manufacturing, Construction and Product Service Technology

The technology of the three main families of industry presented in this yearbook will therefore reflect the managed production system of each family. Manufacturing will focus upon the elements of the managing and producing functions of the in-plant production system. In addition, attention will be given to closely related technologies and other related nontechnological subject matter. Construction will focus upon the on-site managed production system and related knowledge. Product service will follow the same basic pattern.

These three basic families of industry are responsible for the production and servicing of all of the products of the entire man-made world. Without the industrial technology that has been

accumulated over the centuries, man would still be at the mercy of nature and the elements.

Conclusions

In attempting to deal with questions relating to the source and selection of content for industrial arts programs, greater success can be achieved by the curriculum planner if the unique characteristics and needs of the pupil population for whom the content is to be designed are known. However, differential programs of study can be designed if some fundamental curriculum questions are answered, regardless of the nature of the learner.

One major question discussed here centered around the nature and scope of industry. Industry may be conceived very broadly, to include all human effort, or it can be conceptualized in less inclusive terms, depending upon the criteria applied in arriving at classifications. The delineations of the families of industry are dependent upon the scope of industry as defined.

Industry was identified as the source of content for industrial arts (regardless of scope) and industrial technology was identified as the body of knowledge derived from industry. Programs of study should focus on the knowledge of industry (industrial technology) but allow the inclusion of other closely related technologies. In addition, some elements of instruction may be drawn from nontechnological disciplines as long as the central focus of industrial technology is not lost.

For disadvantaged youth everywhere there should be no retreat from the three *basic* families of industry: (1) manufacturing, (2) product servicing and (3) construction. Manufacturing begins with a raw product or with several types of raw products and, by in-plant, mass-assembly production line or other production techniques, manufactures a product classified as either durable or consumable. Product servicing generally refers to the maintenance, repair or replacement of durable goods. Finally, construction usually refers to on-the-job custom building of a structure or device, making use of on-site assembly techniques. In the latter, assembly lines are remote or nonexistent. A presentation of these follow. With some thought that the organization of content presented is suggestive, the industrial arts teacher should find the outlines in the next three chapters a good point for departure.

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CHAPTER SIX

Special Interest Families: Service Industries

W. HUGH HINELY

The previous chapters have described the unique features of the special group of students which this program is to serve. Chapter Five outlines the different families of industrial occupations which may be included in the industrial arts program. One specific family which will be discussed later in this chapter is the area of Servicing Industrial Products. But first, some preliminary considerations to all types of basic industrial arts values will be given.

Values and Influences in Industrial Arts

Probably at no other time in the history of industrial arts have we been subjected to more creative thinking about why we exist as a subject area in the secondary schools. During recent years we have seen several new approaches to the study of this area known for the past half century as "Industrial Arts." Currently, we have numerous curriculum research projects underway and there has been considerable pressure to use other terminology as "Technology," "American Industry," etc. These studies will have a great influence upon our programs of the future.

In order to establish a rationale for including educational experiences in the industrial arts which will help youngsters to make wiser choices in the selection of vocations, we must recognize the importance of planned, sequential programs.

We must keep in mind that our primary objective should be:

1. To develop each student's ability to gain insight and understanding of industry and its place in our culture.

2. To discover and develop talents of students in technical fields and applied sciences.

3. To develop technical problem-solving skills related to materials and processes.

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4. To develop in each student a measure of skill in the use of the common tools and machines.

These objectives, proposed by Dr. Ivan Hostetler (3), have stood for several years and have been referred to by many who develop industrial arts programs. In a recent presentation at Southern Illinois University, Dr. Hostetler emphasizes the point that "If industrial arts education is to realize its full potential as a subject in the curriculum there can be no dichotomy between thought and action . . . " (3: 42-45). He has indicated that there can no longer be emphasis upon "skill and doing" with no integration of the thought process. There must be experience which develops a different type of background for industrial arts teachers. He calls for a greater understanding of a philosophy of education. He visualizes industrial arts as a "liberalizing orientation and understanding of the technology and its place in our culture" (3: 45).

Most of our industrial arts teacher education programs are being evaluated to determine the extent to which we are preparing our graduates to assume their role in the secondary schools. As we strengthen our programs by requiring more depth in science and math, more breadth to include electronics, fluidics, etc., it is difficult to find places for all the traditional activities which have previously been included. To handle special groups of disadvantaged youth who may have limited backgrounds and a predicted shorter period of training, the problem is intensified.

Bateson and Stern discuss the "dominant" and "subordinate" objectives in terms of time (1: 7). The authors indicate that educational objectives cannot exclude other subject-matter area or learning experiences. Each subject, through its unique experiences, helps to educate the child. Earlier the reference was made to the team idea in industrial and other subject matter areas, especially in elementary schools.

As we look at educational objectives and see how several subjects contribute to the same objective it should point out to us that the educational process is complex. Recently, we have been caught up in the trend of stating all of our objectives "behaviorally." This is likely to have a good influence upon the total education program because it will force each subject area

to state clearly and concisely the direction it plans to go. As we look at the broad objectives we have supported through the years, it is interesting to note than many are still being included in much of the recent literature. Dr. H. Bradford Washburn, Jr., states that education is more than the amassing of information. He points out that we must prepare our students to apply this information in the solution of problems of life. We must develop the powers of concentration, patience, perseverance and judgment (14).

We have long discussed the nature of the product and the process in education. Dewey, Kilpatrick, Stoutamire, Strickler and others have emphasized the importance of the process of learning by doing. We in industrial arts have believed that the involvement on the part of the student is the secret to learning. Too often we are criticized for the "doing" which is held by some to be separated from the thought or analysis process. However, it is unlikely that any actual difference in learning takes place. Rather, it would increase the rate and retention through the proper motivation and involvement. When the individual student is involved in a total activity type of learning experience, his retention is greater. Industrial arts in the total education of disadvantaged youth makes this especially true. Their ratio of retention would probably be increased in far greater measure than the average child's retention rate.

During recent years we have concerned ourselves with the development of creativity in our students. A brief review of the literature in industrial arts twenty years ago reveals very little mention of creativity as a concern in industrial arts education. In a profound volume, *An Art Approach to Education,* Fred Strickler proposed in 1941 some very stabilizing thoughts. He suggested that self-orientation starts and possibly ends in the student himself. He implied that there is personal commitment to conclusions and eventual action (10: 116). His discussion of skill, in which most industrial arts teachers are involved, is quite revealing. He points out that it is futile to have preconceived standards or levels for attainment of skill by each individual. This concept is being recognized more today as we plan for upgraded or downgraded classes recognizing that some students are slower and may take more time to achieve levels of accomplish-

ment. Whether it be in language arts, in mathematics or in industrial arts, this is true. Drill or repetition that is inherent in a problem that is worth doing is undertaken willingly, according to Strickler (10: 151). Skill development is very important in communication, in analysis, in synthesis, in interpretation and in understanding of the self-concept. The extent to which the development of manipuative skill contributes to any or all of these is important. It is inconceivable that a student in today's industrial arts would be drilled for drill's sake, however.

Do the psychological processes of learning new systems differ from those we use when we learn existing knowledge? Calvin W. Taylor believes that there is a difference. He believes that education should prepare people who can examine the ideas of the past as well as those of present day scientists and inventors (12: 78-79). We must not stop here, however, for we must provide opportunity for each student to have his natural curiosity stimulated so that it will continue through later life. We have noted that many young children are infinitely curious when properly stimulated. Progressively this curiosity may be stifled in poor schools and resistance is built up. Needed most is the knowledge of how to help these youngsters to continue to be curious and to capitalize upon this in the learning process. Among disadvantaged youth this curiosity is not often whetted by constant motivations. In industrial arts programs, special emphasis should be placed upon such words as "to know," "to examine" and "to change." These desires lead the student to examine advertising critically in attempting to determine differences in consumer items (6: 30).

Another factor which is influencing program design in industrial arts is the Vocational Education Act of 1963, revised in 1968 to include occupational education. The key word here is "occupations." We see that programs or courses in occupations are rapidly expanding not only in the senior high schools, but in the junior high and the elementary schools. Occupations in our world of work have been emphasized before as a motivation for disadvantaged youth. In some elementary schools the "study of occupations" is being considered as the core of the curriculum. Such programs should be carried on, or substantially participated in, by industrial arts teachers. Ralph Steeb has stated a clear position with reference to such courses. The handicapped and

disadvantaged youth commonly identified as potential dropouts should be provided occupational education below the tenth grade, according to Steeb (9: 10-11).

Since this yearbook deals with disadvantaged youth and their participation in industrial arts, it is assumed that the programs will be of a special type and that industrial occupations will be featured. In most instances the ratio of students to teacher will be greatly reduced. This is important because of the great difficulty in getting this type of student involved.

The Changing Nature of the Service Industries

During the years following the Industrial Revolution and until the last decade, the number of individual workers involved in the production of goods, or manufacturing, has steadily increased. However, with the development of automation the relative number of workers in manufacturing as compared to the service industries has declined.

This is due, in part, to the need to maintain the tremendous volume of consumer goods in the areas of household appliances, transportation, communication services and information retrieval. The development of computers in very recent years has given us an even different approach to services. We not only must maintain or service the hardware, but we must prepare competent individuals to provide the proper programs assigned to sophisticated computing equipment. We now rely upon other specialized individuals to provide us with many mechanical services in our homes and office buildings, our transportation and the like.

Many of the industrial services related to industrial devices and other equipment have become very technical and the average consumer in most instances is forced to call in specialists. The average auto owner must rely upon trained mechanics to service his car. Even in such areas as lawn and garden care we find that mechanization and knowledge of proper insecticides is causing us to look at the possibility of purchasing such services as lawn and horticultural care and shrubbery spraying. In addition to these, we are told that with increased longevity we can expect to need the services of many more individuals in the provision of care and services for the elder citizenry.

At the present time we are beginning to see results of improved design in much of the equipment we use. The use of plug-in component groups is coming prevalent, especially in the areas of electronics. The instant servicing of such devices as aircraft communication equipment has already made it necessary to take out and quickly replace whole component sections. This same principle is being applied through the use of integrated circuits. The prediction is that with further development and lower costs of production the use of throwaway integrated circuits may replace much of the service work as we know it today.

Not only is this factor true in the servicing of electronic equipment, but the same kind of change is imminent in such areas as information retrieval and communication. With the tremendous emphasis upon engines which cause less contamination of the atmosphere we can expect revolutionary developments within the next few years. A few engineers believe that we are at the threshold of developing a new high-pressure freon engine which is capable of very high efficiency, at a low cost and with a minimum amount of wear. One specific example of this type of development is the Sarasota Engine (5). This engine burns fuel at atmospheric pressure and causes no excess exhaust of poisonous chemical air pollutants. In addition, it greatly reduces the thermal pollution of the air because it operates at a much lower temperature. There is a minimum amount of noise pollution and the design of the engine and its revolutionary method of driving directly to the wheels eliminates the need for an expensive transmission. The actual engine mechanism is small and operates at a speed slow enough virtually to eliminate wear.

The purpose of the foregoing statements is to stress the imminence of change. The development of such changes will greatly affect the kinds of jobs which we currently think of as service occupations. With this in mind, then, what kind of educational program can best prepare our students for the years ahead?

Shall we eliminate immediately from our curriculum all reference to auto servicing: gas station service, auto tune-up, engine overhaul, brake and front-end alignment and the like? Shall we drop the training of repairmen for electronic devices? Shall we decide now that such appliances as washing machines and air conditioners will be replaced? The answer now is cer-

tainly NO! Not in the very near future. However, as we plan for programs we must keep in mind that our students of today will need to face such eliminations realistically during their normal lifetime.

Criteria for Selection of Service Areas

The general nature of the service industries is beginning to change and the prediction is that this will accelerate to an even more rapid rate. Bateson and Stern (1: 15) hold that service industries are based on capital and skilled workers. They indicate that the essential needs of man are met by these two basics, united to form service enterprises involving the care and mending of material goods used in our society (1: 14). The nature of industrial products which require service is becoming more complex every day. They are complex mechanically, as they make use of hydraulics, pneumatics and electricity. All involve the control of energy through complicated mechanisms and schemes.

Servicing can be simple or complex. It can vary from the replacement and adjustment of the spark plug on a small gasoline engine to the replacement of a component on a Saturn V rocket destined for the moon. It may be no more than replacing the cord on a small appliance or the adjustment of the automatic choke on a family automobile. It may be the cleaning of windows of a family dwelling or on the Empire State Building.

One example of the way such a service can develop into a multimillion dollar business is the story of one of our largest exterminating companies. We are told that in this instance the founder started the company on a very small scale after becoming self-employed in the extermination of household pests. Other instances are equally as interesting. Many enterprising young students earn a considerable amount of money in the summertime by caring for lawns and performing other routine services.

A company was organized recently to provide tours to winter sports activities. This company now provides every service needed from the time the tourist leaves home, until he returns. Although not industrial, this is a service and it must not be overlooked as we consider the changing nature of our service industries. One should examine also the growth of the vast tourist industry in America and observe the character of seasonal em-

ployment it provides. All such service involves people — some highly educated and some with very litle specialized training.

In most areas, industrial service employees are needed and the salaries are very good. Industrial arts could introduce disadvantaged to the service industries. The exploration opportunities in this family of occupations would afford a variety of experiences somewhat different from other industrial families. In such a family, students would become introduced to unique skills, commucative techniques, teamwork and cooperative enterprises. Service industries demand a great amount of direct relationship with the public. Such competencies are often neglected in curriculums from which disadvantaged youth drop out. They must be considered more seriously as industrial experiences are provided to change attitudes among disadvantaged youth toward their prospective roles in society. The technical exploration included in the servicing occupations affords unique experiences which should be provided.

According to the Industrial Arts Curriculum Project's *A Rationale and Structure for Industrial Arts Subject Matter*, industrial servicing is related to the goods industries produce. Industry provides much of the knowledge used by those service establishments and individuals engaged in the servicing of material goods. That is, when industry produces goods such as automobiles and buildings, it also provides the theory of practice for their efficient installation, use, alteration, maintenance and repair by consumers, operators and servicemen (13: 74).

It is important to examine the various occupational clusters within the servicing family. As pointed out earlier, these may be thought of as service to products or goods, (example; engines, mechanisms, etc.) ; as service to people, (example; food service, reservations, etc.) ; and as informational service. The latter is a recent service. The retrieval of information by the computer is a good example. In order to determine the nature of the possible exploratory programs we might provide for disadvantaged youth, all should be considered.

In a chapter on "Subject Matter for the New Industrial Arts" in the book, *Industrial Arts and Technology*, Delmar Olson deals with the technical, consumer, occupational, cultural, recreational and social aspects of the services (7: 228-229). As we study any

specific area, it will be useful to present it in terms of the functions described by Olson.

One of the most important criterion for determining what service courses will be offered is that of *need*. Is the service important in our society? Are there shortages of trained manpower in a particular area of servicing? Can workers trained in this servicing area relate to and change easily to another kind of a position? These questions, if answered in the affirmative, may assist in determining new programs. This criterion relates to possible demand for, or employment of, those who complete the program.

A second criterion which should be included or considered is that of *available finances*. Programs for disadvantaged youth may cost more per individual student than other industrial education groups because it is "special." It is considered special because there may not be existing laboratories and facilities for the program and there may be few, if any, examples on which to rely for planning facilities. Another way that it may be considered as special is in the recommended ratio of students to faculty. It has been found that with these young people a very close working relationship is needed if effective learning is to take place.

A third criterion which should be considered is the population of needy youth and their location. If a program is needed, it must be established where the students are. The student population may be found in the rural areas where agricultural mechanization has replaced manual labor or it may be in the slums of the big cities. Regardless, there must be a student population, and there is little doubt that either need or population is lacking.

Programs in Operation

Research reports describe some of the kinds of programs which have been successful. A few of these will be referred to in the following paragraphs. This will not be an attempt to cite all instances where programs have been developed for disadvantaged youth. It will only point out a few examples of typical situations where the service type courses have been used.

Guatney and Higgins (2: 43-44) describe a program which has been in operation in Rutland, Vermont. This program is

highly successful and students learn to service many different types of small gasoline engines. They are much in demand when they graduate and are able to start at a good salary. Those with ability and ingenuity are able to quickly move up the ladder of success to shop foreman, general manager, sales and possibly owner of their own business.

A similar program has been developed by Joseph H. Martin of Bradenton, Florida. Mr. Martin describes the course in a paper, "Educational Specifications for Occupational Training for Disadvantaged Youth: Course Title, Gasoline Engine Maintenance." This is a very comprehensive program and it has been tested and the results have been successful.

Suggested Service Areas for Disadvantaged Students

Service to Products

Low Achievement Level	High Achievement Level
Appliance Repair	Painting—General & Special
Small Engine Repair	Radio-Television Repair
Blade and Knife Grinding	Refrigeration
Outboard Engine Repair	Telephone Service Repair
Bicycle Repair	Auto Engine Overhaul
Lock and Key Service	Body-Fender Service
Building Cleaning Service	Wheel Alignment & Balancing
Auto Servicing	Household Appliance Repair
Aircraft Servicing	Watchmaking and Repair

Service to People

Low Achievement Level	High Achievement Level
Nurse Aid Service	Cooking—Commercial
Food Service	Baking
Rental Agency Service	Transportation System Service
Receptionist Service	Aircraft Terminal Systems
Aircraft Terminal Servicing	Personal Transportation Service
	Health Technicians

Information Servicing

Low Achievement Level	High Achievement Level
Reservations Service	Computer Servicing
Shipping, Moving and Storage	Data Processing
Scheduling Service	Radio-Television Station Service
Key Punch Operating	New Agent Service
	Information Retrieval

Another program in the area of service station attendants has been offered in the Manatee (Florida) area Vocational and Technical Center. This course was developed by Arthur Kern. E. B. Williams of the same center has developed a course in Horticulture and Landscape Maintenance.

Thomas Strickland, formerly of the Division of Technical and Health Occupations Education, State Department of Education in Florida, has distributed "Guidelines for Establishing Nurse Aid Courses" (11).

All of the above should be of help to the person who is involved in program development in these service areas.

Sample Course Outlines

The following outlines are submitted because they represent two very important areas for training:

1. "Educational Specification for Occupation Training for Disadvantaged Youth: Course Title, Gas Engine Maintenance, by Joseph H. Martin.
2. "Service Station Attendants," by Arthur Kern.

Course content outlines showing illustrations of even a random sample of service occupational families would require a volume of space unacceptable in this manuscript. Those which follow do not represent the more sophisticated service families. It seemed logical, however, to give illustrations of courses which have been organized and used in disadvantaged communities. This should not preclude the development of more technical offerings for the deprived peoples of our society. Rather, it should provide an illustration of some initial steps to get special interest groups occupied and motivated. Although somewhat unchallenging to some, these illustrations are indicative of what has been accepted and appreciated by disadvantaged youth in their search for identity and a feeling of belongingness in our society.

GAS ENGINE MAINTENANCE
(Special Disadvantaged)

INSTRUCTOR: JOSEPH H.MARTIN
Manatee County Vocational Technical Center
Bradenton, Florida

A. Numbers
    1. Student-Teacher ratio 12-1
    2. Best ratio 8-1

B. Activities
   1. Teacher
      (a). Planning and preparing for teaching; developing course and unit outlines, lesson plans, instructional materials and evaluation instruments.
      (b.) Counseling of students.
      (c.) Teaching knowledge and skills involved with the occupation and orientation to work-related responsibilities.
      (d.) Supervising students' practical application of knowledge and skill within the occupation.
      (e.) Preparing reports and maintaining records.
      (f.) Planning for and participating in general and departmental faculty meetings.
      (g.) Planning for and participating in individual and group activities designed to improve instruction and provide a better understanding of the students and their problems.
   2. Students
      Student shall be guided and work toward the development of the knowledge, skills and attitudes needed to equip them for obtaining and maintaining employment upon completion of the course. Activities shall consist of theory and practical application of occupation, requirements of employers in regard to attitude and attendance, etc.

   I. Fundamental Tools
      A. Care and Use of: (Hand)
         Screwdrivers
         Combination wrenches
         Adjustable wrenches
         Tapes and rules
         Instruments of measurement relative to mechanics
         Hammers (hand and power)
         Open end wrenches
         Hacksaws
         Pliers
         Sockets and relative accessory tools

      B. Care and Use of: (Shop Tools)
         Drills, hand and stand
         Press, hand and/or power
         Drill bits
         Instruments of measurement
            (vernier calipers-micrometer-tachometer)
         Benches, stands and wash tanks
         Vises
         Grinders and face shields
         Tube flaring equipment
         Valve grinding equipment (hand and power)
         Shop manuals and parts books

II. Parts—Cleaning and Care
  A. Materials
    1. Kerosene or mineral spirits
    2. Gunk
    3. Gasoline
    4. Carburetor cleaners
  B. Parts
    1. Tear down and identification
    2. Sorting and grouping
    3. Selection of proper cleaner and storage
  C. Spark Plug
    1. Cleaning and setting
    2. Hot or cold
    3. Fouling causes, cures

III. Small Gas Engine Maintenance
  A. Types and Fundamental Operation
    1. Two cycle
    2. Four cycle
  B. Special Tools
    1. Starter wrenches
    2. Flywheel holding wrenches, etc.
  C. Oils
    1. Types and grades
    2. Mixing (two cycle)
    3. Weather and viscosity
  D. Fuel
    1. Gas
    2. Grade
    3. Octane
    4. Temperature
  E. Maintenance and Overhaul Procedures
    1. Tune-up
    2. Sharpen blade
    3. Straighten wheels or repair
    4. Complete overhaul (rings, valves, bearings, etc.)
  F. Work Attitudes and Behavior
    1. Being on time
    2. Courtesy
    3. Getting along with others
    4. Willingness
    5. Cleanliness
    6. Stamina
    7. Safety

Bibliography for Small Engine Maintenance
  A. Parts books, shop manuals, periodicals and supplements
    from:
    1. Lawn Boy

2. Clinton
3. Briggs-Stratton
4. Lawson
5. Power Products
6. Tecumseh

B. Books
1. *Small Engine Service Manual*, 8th ed. Kansas City, Missouri: Technical Publishers, Inc., 1966.
2. Stephenson, George E., *Power Mechanics*, Albany, New York: Delmar Publishers, 1963.
3. Stephenson, George E., *Small Gasoline Engines*, Albany, New York: Delmar Publishers.

SERVICE STATION ATTENDANTS
ARTHUR KERN, INSTRUCTOR

Manatee Area Vocational & Technical Center
Bradenton, Florida

This teaching outline is arranged to provide content for 1080 hours of basic instruction. It is offered in two school years. Each year contains 540 hours of instruction, 3 hours per day for 180 days.

Not all students are to be expected to complete all of the areas in the 1080 hours allotted. This is a general outline with a definite goal. The well-motivated and mechanically inclined student may well expect to complete all of the areas. However, the completion of just a few areas should help the student to be more valuable on the labor market of today.

1. To teach the basic fundamentals of auto service.
2. To develop habits and attitudes of self-direction and the ability to reason out problems independently.
3. To develop an appreciation of a worker's responsibilities to his customers, to his employer and to himself.
4. To help the student realize that a job well done is of the utmost importance and will lead the way to a better future.
5. To provide adequate training and enable the student to enter the labor market of today.

First Year Students

Block I   Orientation
Block II   Opportunities in Auto Service
Block III   Tools and Equipment
Block IV   Service at the Island
Block V   Cleaning the Car
Block VI   Components of the Auto
Block VII   Tire Service
Block VIII   Lubrication Procedures
Block IX   Miscellaneous Service Items
Block X   The Battery
Block XI   Lighting System

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Block XII   Exhaust System
Block XIII   Brake System
Block XIV   Cooling System
Block XV   Fuel System
Block XVI   Ignition System
Second Year Students
Block XVII   Starting System
Block XVIII   Charging System
Block XIX   The Engine
Block XX   Engine Tune-up

Block I. Orientation
   A. Introduction to rules
      1. School campus rules
      2. School clothing
      3. Use of facilities
      4. Use of tools
   B. Introduction to class
      1. Other students
      2. Class procedures
   C. Introduction to Training
      1. Purpose of the course
      2. Expected course content
      3. Work expected of the student
   D. Employment Requirements
      1. Social security number
      2. Birth certificate
      3. Work permit
      4. Obtaining references
      5. Filing applications

Block II. Opportunities in Auto Service
   A. Service Station
      1. Gas island service
      2. Lubrication service
      3. Tire service
         a. balancing
         b. repair
         c. installation
      4. Service station mechanic
         a. brake repairs
         b. engine repairs
         c. front-end alignment
         d. tune-up
   B. Auto Agency
      1. Lubrication work
      2. Minor repairs
      3. Regular mechanic
      4. Specialty mechnic

Block III. Tools and Equipment
  A. Identification, Use and care of hand tools
    1. Screwdrivers
      a. phillips
      b. clutch head
      c. regular
      d. offset
      e. screwstarter
    2. Pliers
      a. slip joint
      b. multi-groove (channel lock)
      c. needlenose
      d. sidecutters (diagonal cutting)
      e. vise-grip (lever wrench)
      f. end-cutter nippers
      g. tongue and groove pliers
    3. Hammers
      a. ball peen
      b. soft faced (plastic, wood, rubber)
    4. Chisels
    5. Adjustable wrenches
    6. Punches
      a. drift (aligning)
      b. center
      c. pin (rivet punch)
    7. Scrapers
      a. pliable type
      b. stiff type
    8. Allen wrench set
    9. Wire brushes
  B. Identification, Use and Care of Large Tools
    1. Bench grinders
    2. Air wrench
    3. Electric drill, ⅜"
    4. Vacuum cleaner
    5. Vise
    6. Parts washer
    7. Air hose
      a. air chuck
      b. blow gun
      c. air gauge
    8. Jacks
      a. floor jack, 2½ ton
      b. bumper jack, 1½ ton
    9. Air chisel

Block IV. Service at the Island
    A. Desirable Personal Qualities
       1. Neatness
       2. Cleanliness
    B. Customer Approach
       1. Attitude
       2. Manner
       3. Speech
    C. Island Tools — Identification and Use
       1. Pump
       2. Battery filler
       3. Water container
       4. Windshield sponge
       5. Paper towels
    D. Fueling the Auto
       1. Types of gasoline
       2. Types of oils
       3. Safety around gasoline and oil
       4. Use of gas pump
       5. Under hood check
       6. Courtesy check
       7. Window cleaning
       8. Figuring the sale and collecting
         a. counting change
         b. figuring tax
    E. Cash Register
       1. Care of
       2. Use of
       3. Marking the tape
    F. Credit Cards
       1. Use of
       2. Writing of
       3. Spotting a bad one

Block V. Cleaning the Car
    A. Washing and Polishing
       1. Car wash compounds
       2. Washing procedures
       3. Rinsing procedures
       4. Cleaning tires
         a. white-wall
         b. black-wall
       5. Types of cleaners
       6. Types of polishes
       7. Cleaning the finish
       8. Polishing the finishes

B. Cleaning the Interior
   1. Vacuuming
   2. Cleaning vinyl
   3. Cleaning leather
   4. Cleaning cloth upholstery
   5. Cleaning dash

C. Chrome Cleaning
   1. Types of cleaners
   2. Cautions in cleaning
   3. Removing rust

Block VI. Components of the Auto
A. The Engine
   1. Fuel system
   2. Cooling system
   3. Ignition system
   4. Charging system
   5. Starting system
   6. Basic parts internally

B. The Drive Train
   1. Clutch assembly
   2. Manual transmission
   3. Automatic transmission
   4. "U" joints
   5. Drive shaft
   6. Differential
   7. Springs and wheels

C. The Frame and Body
   1. Types of frames
   2. Unibody construction
   3. Body parts or sections

D. The Front End
   1. Construction of
   2. Geometry of

Block VII. Tire Service
A. Tire Construction
   1. Parts
   2. Sizes
   3. Ply ratings

B. Use of Tire Changer
   1. Safety
   2. Type of rims
   3. Special precautions if tube type

C. Repairing the Tire
   1. Tube repairing
   2. Tubeless tire repair
   3. Precautions regarding balance

D. Care of Tire
   1. Cleaning the whitwall
   2. Inflation problems
   3. Rotating the tires
E. Tire Balancing
   1. Why balance
   2. Care of machine
   3. Safety precautions
   4. Using the machine

Block VIII. Lubrication Procedures

A. Raising the Vehicle
   1. Centering the vehicle
   2. Blocking the vehicle
   3. Positioning safety stands
   4. Safety check
      a. jack safety on
      b. safety stands solid
B. Checking Miscellaneous Items
   1. Master cylinder
      a. type of fluid
      b. filling the cylinder
   2. Power steering
      a. type of fluid
      b. filling unit
   3. Clutch master cylinder
      a. type of fluid
      b. filling unit
C. The Pressure Grease Gun
   1. Use of gun
   2. Special adapters
   3. Cleaning the gun
D. Hand Gun
   1. Use
   2. How to fill
   3. Special adapters
E. Greases
   1. Chassis
   2. Ball joint
   3. Wheel bearing
F. Gear Lubrication
   1. Types of gear lubes
   2. Weights of gear lubes
   3. Checking the gear boxes
   4. Use of gear lube dispenser
   5. Filling the gear boxes

G. Automatic Transmission
   1. Checking oil level
   2. Types of oils
   3. Draining the transmission
   4. Refilling the transmission
H. Oil Change
   1. Location of drain
   2. Appropriate wrench
   3. Neatness
   4. Types and weights of oils
   5. Filling the crank case
      a. use of capacity chart
      b. use of lubrication sticker
I. Oil Filter Change
   1. Types of filters
   2. Location of filters
   3. Wrench or tool use
   4. Cross reference chart
   5. Installation
   6. Checking for leaks
J. Courtesy Checks and Service
   1. Water leaks
   2. Worn tires
   3. Loose parts
   4. Drive shaft
   5. Oil leaks
   6. Tire air pressure
   7. Vacuum the car
   8. Clean the windows
   9. Lubricate door latches, etc.

Block IX. Miscellaneous Service Items
A. Positive Crankcase Ventilation
   1. Function of system
   2. Checking valve
   3. Remove and replace valve
B. Shock Absorbers
   1. Function
   2. Testing
   3. Remove and replace
C. Windshield Wipers
   1. Remove and replace blades
   2. Adjust arms
D. Wheel Bearings
   1. Front wheel bearings
      a. remove and replace
      b. repack
   2. Rear wheel bearings
      a. use of puller
      b. remove and replace bearings and seal

Block X. The Battery

    A. The Battery's Job

    B. Construction

    C. Care of the Battery

    D. Testing and Charging

Block XI. Lighting System

    A. Headlights

        1. Types of bulbs

        2. Installing sealed beam

        3. The wiring system

        4. Adjusting headlight aim

           a. for height

           b. for direction

    B. Tail Lights

        1. Types of bulbs

        2. Installing the bulb

        3. The wiring system

    C. Interior Lights

        1. Dome lights

        2. Dash lights

    D. Miscellaneous Lights

        1. Parking light system

        2. Turn signal system

        3. Back-up light system

    E. Servicing the Systems

        1. Splicing a wire

        2. Fuses and circuit breakers

        3. Tracing a short circuit

        4. Switches — replace and repair

Block XII. Exhaust Systems

    A. Special Tools

        1. Pneumatic muffler tool

           a. inside pipe cutter

           b. outside pipe cutter

           c. cut-off chisel

           d. pipe expander

    B. Construction and Function

        1. Header

        2. Muffler

        3. Tail pipe

        4. Resonator

    C. Replacement and Repair

        1. Removing

        2. Positioning

        3. Use of alternate (universal) parts

        4. Re-installation

Block XIII. Brake System
    A. Construction
        1. Master cylinder
        2. Power brake cylinder
        3. Wheel cylinder
        4. Brake shoes
    B. Master Cylinder Service
    C. Adjusting Brakes
        1. Types of tools
        2. Adjusting each wheel
    D. Repairing Brake Lines
        1. Cutting tubing
        2. Flaring tubing
        3. Replacing lines
    E. Repairing the Brakes
        1. Special tools
        2. Honing the cylinder
        3. Replacing the shoes
        4. Bleeding the system
           a. pressure bleeding
           b. manual bleeding

Block XIV. The Cooling System
    A. The Radiator
        1. Construction and care
        2. Flushing
        3. Repair
        4. Remove and replace
    B. The Water Pump
        1. Construction
        2. Remove and replace
    C. The Thermostat
    D. Belts and Hoses
        1. Checking
        2. Remove and replace
    E. The Heater
        1. Hoses
        2. Heater unit, remove and replace
    F. Additives
        1. Antifreeze
        2. Coolants
        3. Rust inhibitors
        4. Stop leaks

Block XV. The Fuel System
    A. The Parts
    B. Fuel Line Repair
    C. Fuel Pump
        1. Remove and replace
        2. Use of pressure gauge

D. Fuel Filters
  1. Types
  2. Remove and replace
E. Carburetor
  1. Systems
  2. Cleaning
  3. Remove and replace
  4. Air filter care
  5. Adjusting the carburetor

Block XVI. The Ignition System
A. The Primary Circuit
  1. Circuit wiring
  2. Coil
  3. Points
    a. adjust
    b. remove and replace
  4. Condenser
    a. function
    b. remove and replace
B. The Secondary Circuit
  1. Coil
  2. Distributor cap
    a. function
    b. remove and replace
  3. Rotor
    a. check
    b. remove and replace
  4. Wires
    a. check for imperfections
    b. remove and replace
  5. Spark plugs
    a. use of specification chart
    b. use of feeler gauge
    c. use of cleaner and tester
    d. remove, clean, adjust and replace

Block XVII. Starting System
A. The Circuit
B. Rebuilding the Starter
  1. Removal
  2. Use of test equipment
  3. Turning the armature
  4. Installation of brushes
  5. Re-installation
C. The Solonoid
  1. Delco-Remy type
  2. Ford type
D. Testing the System
  1. Voltage drop test
  2. Ampere pull test

Block XVIII. The Charging System
    A. The Generator
        1. Testing
        2. Rebuilding
    B. The Regulator
        1. Function
        2. Testing for current setting
        3. Testing for voltage setting
        4. Remove and replace
    C. The Indicator Circuit
        1. Dash light
        2. Ammeter

Block XIX. The Engine
    A. The Types
        1. Valve-in-head
        2. Valve-in-block
        3. Other types of valve arrangements
        4. "V"
        5. In-line
        6. Horizontal opposed
    B. Valve System
        1. Intake
        2. Exhaust
        3. Valve angle
        4. Valve adjustment
    C. Camshaft
        1. Valve timing
        2. Ignition timing
        3. Oil pump
    D. Cylinder Construction
        1. Piston and rings
        2. Rods
        3. Wrist pin
    E. Crankshaft
        1. Main bearings
        2. Rod bearings
        3. Oil dispersion
    F. Manifold
        1. Intake
        2. Exhaust

Block XX. Engine Tune-Up
    A. Function of Miscellaneous Parts
        1. Primary system
        2. Secondary system
        3. Fuel system
        4. Compression ratio
        5. Vacuum available

B. Checking the ignition system
   1. Use of the ignition tester
   2. The circuit resistance
   3. Dwell angle
   4. Distributor advance mechanisms
   5. Coil output
      a. 1700-2000 rpm — no load
      b. 1700-2000 rpm — load
   6. Spark plug wire test
   7. Spark plug test
   8. Voltage regulator setting
C. Checking the fuel system
   1. Compression test
   2. Vacuum test
   3. Use of exhaust analyzer
   4. Idle test
   5. 2000 rpm test

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Facilities for Service Programs

In some instances the program which has been suggested, or which may be developed, can be carried on in existing laboratories if they are available and if they meet the needs. In many other situations, however, it will be necessary to design and to build facilities for the program.

The first consideration in the acquisition of facilities would be the development of educational specifications. These should

be prepared by the persons who develop programs, working in cooperation with school facilities specialists. Certainly the procedure to be used here should take into consideration the principles which have been developed by specialists in industrial arts.

One of the more recent and rather complete guides which will be helpful to facility planners is *Planning and Designing Functional Facilities for Industrial Arts Education*, by Marshall Schmitt and James L. Taylor. This publication points out the emerging educational trends in industrial arts, describes the function of the planning committee, outlines the types of space needed, and gives guidelines and recommendations which are helpful to facility planners. In addition, this publication has an up-to-date list of references which will be helpful in this area. This reference "proposes to illustrate an approach to good planning and to open new vistas to those responsible for making plans, not to set standards" (8: 2).

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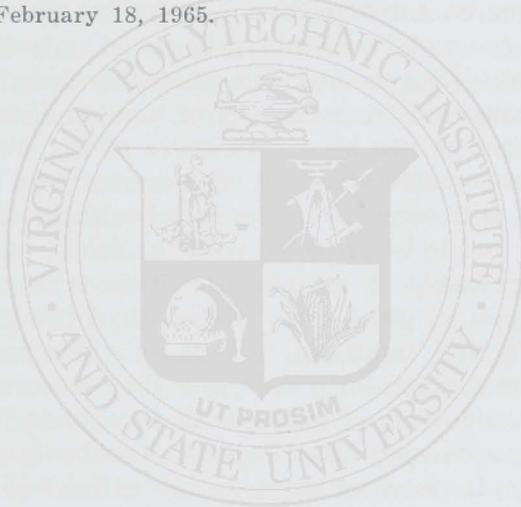
Special Interest Families: Manufacturing Industries

JOHN R. LINDBECK

The characteristic which distinguishes a modern industrial society from all others is its ability to produce high quality goods in large volume at a reasonable cost. Indeed, it can be stated that societies have endured and progressed only as they have succeeded in providing the products needed by their participating members. Throughout the centuries of man's existence, technological advancement has been a measure of his social progress toward a more comfortable and meaningful life. Before man could register achievements in the social-cultural dimensions of his society, he had to be provided with the foods, tools and other implements necessary to sustain life. This is surely an oversimplification, but it gives some indication of the importance of man's capacity for industrial efficiency. The manufacturing industries loom significantly here, for they form the basis for this efficient production of goods, both durable and consumable. A term which accurately describes this feature is *productivity*. This, very simply, is a measure of the efficiency with which resources are converted into the goods and services that people want.

In the slums, whether in the inner city or in the rural wastes, people have great need for goods and services yet they have no means to become consumers. Learning about and learning skills in the methods of productivity should motivate the disadvantaged people to move out and become more involved in the industrial complex of our society. It should be made clear that large segments of our people in society are engaged in the various facets of manufacturing. This should reduce the fear among disadvantaged people to enter it.

The miracle of modern industry occurred when man shifted his mode of manufacture from a custom to a mass-production

scheme. *Custom* production refers to the manufacture of single objects, frequently one-of-a-kind, made to order by one individual. The craftsmen of yesterday made chairs, vehicles, clothing and weapons in this manner. The resultant products were costly, and the work was slow and tedious. Similarly, the designer-craftsman of today still creates elegantly crafted articles, but for a very selected consumer clientele. *Mass production* is the volume manufacture of objects, employing sophisticated assembly-line methods based upon the principle of the interchangeability of parts. It further involves a unique division of labor, so that each member of a production line performs a single operation. These primary attributes — automatic conveyance of workpieces, parts interchangeability, and labor specialization — are the principles of any mass-production system. A superstructure of enlightened, scientific management is an additional requisite to its continued growth and success. Disadvantaged youth often never learn about this system of organization and management while in school. Some may live a lifetime without becoming aware of vast opportunities for becoming a part of it.

And what of the future of industry? Recent times have seen the development of patterns of increasing productivity, largely through the implementation of research into new materials, new machines and increased technical skills. But the subject which is of the greatest interest to the general public is *automation,* a production system based upon communication and control, but distinguished from traditional systems in that both of these functions are performed by electro-mechanical devices rather than by human beings. Already one can see many evidences of automation in industry: the automatic production of engine blocks; the automatic control of traffic systems in large cities; automatic materials conveyance systems; and even automatic factories where production goes on for 24 hours per day, and where human beings serve primarily to load, direct and maintain the machines. Some very human problems emerge as toxic effects of this system. Will the machine become the master of man; will man cease to use his creative capacities; and will man be able to exist without the challenge of work? These are the questions raised. It is obvious that men will have to attend to the human problems which accrue to the rapidly expanding

technical society. The purpose of this unit of classroom activity, i.e., The Manufacturing Industries, is to provide an educational experience which will help young people to comprehend the nature of and the opportunities in their technological society, to the end that they will be better able to cope with the myriad problems that arise in it.

The Essentials of Industry

The things required by man to satisfy his material needs emerge from an interaction among basic resources. These resources are the essentials of an industry, the raw stuff which makes possible the fashioning of usable goods. There are three of these essentials:

Material Resources — the range of substances available to man, such as ores, timbers, fuels and chemicals, from which he creates objects for his use. These substances may occur in a natural state, such as wood, or may be man-made, as with plastics. A dynamic industrial society is characterized by the concern it shows for the proper utilization and conservation of its raw materials. Supplies of certain minerals and fuels are being depleted, but through an active research program man is discovering new materials and new uses for old ones. Field trips and audio-visual aids should bring this information to disadvantaged youth.

Capital Resources — the range of devices and facilities required by man, such as tools, machines, factories and communication systems, with which he works his material resources. The efficiency of an industry depends largely upon the development of improved methods of processing materials. Recent years have seen the introduction of automated machinery and a broad spectrum of new tools and equipment, with a resultant increase in productivity. The continued growth of an industry requires a constant reassessment of its production system, and a reinvestment in new capital goods to maintain this growth.

Human Resources — the range of skills possessed by man, such as managerial, technical, manipulative and research, which he applies to his capital resources. Man plays the central part in any production scheme, for he is the planner, manipulator and regulator of the industrial essentials; productive efficiency

is totally dependent upon his skill and ingenuity. Of paramount importance is the realization of the roles played by men in the production of the material necessities for existence. All men contribute to this production, as line operators, as skilled technicians, as managers, as designers and as consumers. The value of each in the total scheme must be recognized and appreciated. A continued search for the best use of human resources and the redeployment of personnel is involved with continued growth.

An interesting feature of these resource systems is that they are in a constant state of flux, with the result that a change occurring in any one has a decided effect upon the other two. Many illustrations of this interdependency can be given. For example, as the need arose for a material capable of withstanding the 5000°F heat of a space vehicle reentering the earth's atmosphere, a special plastic-ceramic ablative material was developed. Subsequently, man had to develop machines to work this material and train men to operate these machines.

Technological changes emerge from almost any source. The laser theory was a product of a man's imagination; through applied research, other men developed equipment and techniques to employ this theory in cutting and fastening operations, and in communication systems. With the advent of the internal combustion engine, the driver of a horse-drawn carriage had to learn to drive a bus; because of developments in welding technology, the oxyacetylene welder had to learn inert gas techniques; and the old-time hand bookkeeper today must be able to use electric typewriters, calculators and desk computers.

Technological changes are accelerating at an unprecedented rate, and shall continue to do so in the foreseeable future. It becomes obvious that this condition poses a myriad of problems for the technician who must engage in this research and development, and for the worker who must be trained, retrained or displaced. Consequently, it is important that the young disadvantaged person understand the nature and function of these material, capital and human resources of industry; hopefully, he will become aware of the kinds of changes taking place in these essentials, why they occur, and why he must adjust to them. Not only the disadvantaged youth need to learn to make constant adjustment, all levels of society need to learn the same.

The Elements of Industry

By way of definition, the elements of industry provide a logical and efficient means of organizing the work necessary to mass produce goods of a high quality. As has been stated previously, the function of the manufacturing industries in modern society is to supply the required goods for human consumption. This process involves the manipulation of the essentials, i.e., the working of the material resources by human beings, employing the tools and machines of industry. This vast and comprehensive manufacturing effort can be considered as a system of elements which rationalize the manipulation of resources.

This network system can be further described as the route traveled by a product, from the mind of the originator to the hands of the consumer. These elements are identified, illustrated and described below, and a sample product is followed through the various stages of mass production.

Research and Development — the generation and refinement of ideas leading to the creation of products. The scope of research activities is in actuality very broad; it includes developmental work in new processes, experimentation with materials, the collection of information through market research and designing new articles. The prime area of concern for this unit of study is with the creation of new products and the improvement of existing ones. Though man has always been so involved, in recent years the "team concept" in designs has evolved. This has come about through a recognition that many design problems require for their solution a variety of professional skills, from the engineer to the artist. With the illustration of a manufacturing problem involving a product such as a chair used in the home, office or public building, the designer would study the functional and material requirements of the product and proceed to develop sketches. Experimental work would be carried on until a final solution was achieved.

Production Tooling — the development of special jigs, fixtures and other devices to facilitate the processing of materials. This phase of work is generally referred to as "tooling up" in the manufacturing scheme. Here the production drawings and the product prototypes are studied by engineers and technicians. Tools, dies, fixtures, jigs, machines and other equipment are

designed, made and tested. Tooling is an activity requiring highly skilled workers to produce the devices necessary to build the designed product. Assume that a *molded plastic fiberglass shell chair* was designed, with bent steel tubular legs. The tooling required for the chair would similarly evolve from a close examination of the final drawings and the prototype. Molding dies for the fiberglass shell would be prepared, as would special jigs to facilitate bending the leg structure. Consideration would be given to devices needed to aid the final assembly of the chair.

Production Control — the study and planning necessary to insure the proper flow of materials through the assembly line. This is an important phase, as the control engineer must examine the product design and ascertain the production requirements in terms of materials, men, and machines. Cost analyses, time studies and production figures are some typical examples of factors to be studied. Very simply, control can be reduced to the assurance that the right material gets to the right place at the right time. The control problems for the chair are typified by determining the stages of production and their placement along the assembly line. The plastic shell would probably be formed in a series of operational flow charts. The final phase of the production control work would be the supervision of the factory layout preparatory to the actual production of the chair.

Quality Control — the establishment and maintenance of standards of product excellence. Quality control specialists must determine which components are suitable for use in the assembly line and which are not. More specifically, they must set the level of product acceptance, and devise special equipment to measure the quality of the product against these standards. Products failing to meet these specifications would be rejected. In many industries, it is not practical to check the quality of every part. For example, the best test for a shotgun shell would be to fire it. Unfortunately, this would leave nothing but the test results. In these instances, a few parts from a production run are checked; this number is called a sample. If a predetermined (and too high) percentage of this sample is found defective, the entire lot is rejected. The quality of the chair could be measured by visual inspection of the possible flaws in the plastic and metal surfaces, and improper fit of the joints.

A sampling of the chairs may be "torture-tested," that is be destroyed to ascertain their strength and reliability. Each of the inspections would of necessity be made against established standards. Teaching the elements of quality control to our youth whether disadvantaged or not develops societal responsibility. In essence this field requires that everyone, regardless of his position, is expected to take every reasonable precaution to make sure of the safety of others. What would the reasonable person do? This is the question asked by quality control.

Personnel Management — the selection, training and supervision of employees for industry. Each child in disadvantaged areas should be given the opportunity to study job descriptions, to visit industrial establishments and see these jobs performed as they are, by real live people. Further, through guidance counselors, the job description study should be related to the individual child's interests, aptitudes and capacities. In an industry, everyone from the president to the newest man on the production line is an employee. Job descriptions establish the guidelines for recruitment and training; specific persons are selected to fill the required positions in the production scheme. The successful business enterprise recognizes the mutual interdependence of all persons involved in its operation. This is the human dimension of an organization; this is the meaning of the human described earlier. The broad range of skills represented in any industry translates the hope of achievement into reality. The organization required to mass manufacture the chair would be determined by the managers and supervisors. Men would have to be selected and trained to perform such tasks as preparing the fiberglass materials, molding the materials into the shell-form, burring and polishing the edges of the completed shape, bending the metal legs and assembling the chair. Others would be needed to pack and ship the chairs; and it goes without mention that these are supported by a myriad of clerical, supervisory and technical staff.

Manufacturing — the transformation of stock materials into a completed article, by means of cutting, forming, fastening and finishing operations. This is the testing phase of the production scheme, the test of all of the designing and planning effort. It is here that the tangible product emerges. The components of

the chair are worked into a final form. Fiberglass is molded into a durable shell, tubing is cut to length and bent to shape, the metal leg structure is fastened by welding, a spray finish is applied to the welded members and the final assembly of the component parts is then accomplished. Manufacturing is simply a matter of changing materials from a raw state into a form more useful to man.

Marketing — the process of bringing finished goods from those who make them to those who use them. It might be said that the final phase of any production scheme is to assure that the finished goods are put into the hands of a satisfied consumer. This involves several intermediate steps, such as packaging, advertising, distributing and selling. The completed chairs must be packaged, transported to wholesale and retail stores and then sold to persons who will use them, and all this effort must be supported by an active advertising campaign. Magazines, newspapers, television, radio and store placards are used to promote the sales of the chair. The element of marketing is extremely comprehensive in its scope of involvement with production. It is concerned with design, engineering, inventories, pricing, advertising and numerous other activities not generally associated with the selling act. The nature of these elements of marketing is motivated by the buyer's resistance as it relates to a scheme of developing ideas and information picturing needs and desires of the public to break down customer resistance.

The complexity and range of the production network becomes obvious. The industrial organization — comprising control boards, stockholders, managers and skilled workers — has in fact but one goal: the manufacturing of high quality goods at the lowest possible cost to meet the demands of a consumer society. Toward this end, the elements of industry are revealed as seven teams, each performing a single function, but also totally interdependent. There must be a continuous dialogue among the groups, with an interchange of information and ideas leading to the realization of the successful product. This ideal is reproduced graphically in Figure 5. An examination in depth of any one element will produce the same results: each is comprised of single-minded individuals whose every effort is an expression of the purpose of the total organization.
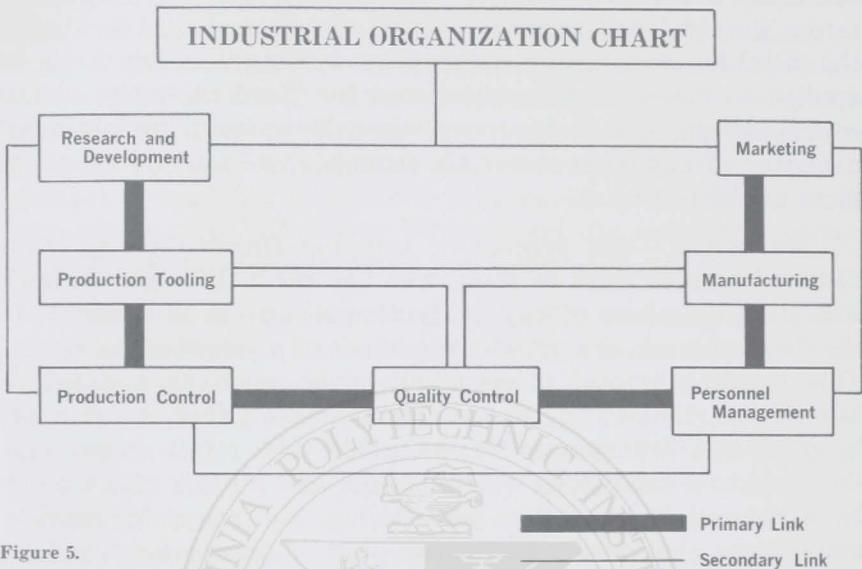
Figure 5.

A Sample Instructional Unit

The purpose of an instructional unit is to provide a suggested outline for an experience in learning. Here the instruction unit is described as one in an industrial-arts-centered experience in mass production. The preliminary information presented in earlier paragraphs served to offer a background to this experience by examining the essentials and elements of industry, and identifying their educational relevance. It should be noted that the success of this venture depends upon the ability of the teacher to engage his student teams in independent inquiry. The interdisciplinary nature of this inquiry is illustrated in Figure 6. These possibilities should be explored. Students, therefore should be encouraged to move out of the classroom in order to investigate the various elements of the program. For example, the Quality Control (QC) team should begin its work by studying the resource materials available in the industrial arts laboratory. Their research can be continued by meeting with a quality control engineer, by visiting the quality control section of a local factory, by discussing sampling techniques with the mathematics teacher and by using reference books available in the school library. It is not necessary for each team member to engage in

CONTENT AREAS		COLLABORATIVE AREAS
Product Research Materials Research Design Sketching Experimentation Models and Mockups	RD	History Science Art Mathematics Sociology
Tool Design Tool Drawing Tool Making	PT	Science Mathematics Communications
Materials Transfer Plant Layout Work Scheduling Equipment	PC	Science Mathematics Communications Sociology
Standards Testing Device Sampling	QC	Science Mathematics Communications
Job Descriptions Selection Training Supervision	PM	Sociology Communications Economics

Material Processing:
   Cutting
   Forming
   Fastening
   Finishing
	MF	Science
		Mathematics
		Communications

Packaging Advertising Distribution Selling Servicing	MK	Communications Business Economics Art Sociology

RD — Research & Development
PT — Production Tooling
PC — Production Control
QC — Quality Control
PM — Production Management
MF — Manufacturing
MK — Marketing

Figure 6.

the same kind of research; the advisability of assigning the responsibility for investigating different resources should be emphasized.

The industrial arts teacher, and his assistants if the class is large, must demonstrate the use of tools, machines and materials throughout this program. It will be noted that every student will be personally involved in manipulative experiences, and it follows that he must be provided with some information relative to them. Some of this can be acquired by films, filmstrips, slides, loop films, charts, textbooks and other visual aids, which the student can seek out and employ as the need for them arises. The acquisition of this background information can be followed by a demonstration by the teacher. The key point here is that students must be encouraged to engage in independent exploration and discovery into these manipulative activities.

The specific class activity is to examine the nature of industry, to plan a simple product, and to mass produce a considerable number of these articles. For the purpose of illustration, assume that the class is comprised of 16-20 students, aged 13-16, who possess some familiarity with tools and materials. The assignment is to design and produce 25 identical articles. This might well be a second-semester experience during a one-year industrial arts course. Further, it is proposed that the class should meet for one long period (depending on interest span) per day, five days each week, for at least eight weeks. These administrative decisions are somewhat arbitrary, but one must begin somewhere by making assumptions or establishing some delimitations.

The first semester will have covered basic tool use in the industrial arts complex. It must be assumed further that the essential tools and materials have been provided previously and that elementary school industrial arts exploration has been accomplished. Earlier in this book references were made to industrial arts in elementary schools and to team teaching in and with the common learnings program.

Teacher/Class Activity

First Day. Show short film on mass production and discuss; or, present illustrated lecture-discussion on modern mass production. Explain the purpose of the course, assign readings on the elements of industry and

suggest that each student be prepared to select a phase of work which interests him (e.g. Production Tooling, Quality Control, etc.).

Second Day. Review and discuss the elements; assign, by mutual agreement and according to their interests insofar as possible, three students to each of the seven groups. The teacher will meet with the Research and Development (RD) team, and investigate possible product design areas. The teacher should have a number of ideas and sample products to show to the team. These could be partial design problems, or simple articles with "boy appeal." Several are suggested at the end of this chapter. Meanwhile, the rest of the class can examine interesting reference materials (and perhaps react to a study guide) which pertain to their team assignments. Available films and filmstrips should be used by these teams.

Third Day. Report to class on the problems and progress of RD team. Discuss the importance of the manufacturing industry in modern society. Begin to develop some associated socio-human problems involved with the project (who does what, etc.). Continue with RD team to help with product development. Other teams will make suggestions as they analyze their responsibilities, and set up guidelines. (Assistance can be obtained from reference materials.)

Fourth Day. Spend some class time identifying other sources of information. For example, the groups could visit an industry and talk with engineers; or, industrial personnel might be persuaded to meet with the teams to discuss their responsibilities. The Production Tooling (PT) group should study sample tooling devices (perhaps some used by previous classes), to help them in identifying the ways in which their group would or could attack their tooling problems. Have each student select an individual research problem, from a list of manufacturing topics developed in class. Some suggested topics for a start can be found at the end of this chapter. Libraries, particularly in large cities, may have materials collected which will be helpful. Permit students to go to the library or take them there to be sure they get this experience. Use classroom materials, or consult other teachers. Whenever students have free classtime, they may work on these research assignments. A collection of references should be provided for their use. The level of reading should be carefully selected for the reading level of the group.

Fifth Day. Weekly summary of activities. Part of the period each Friday should be given over to a summary of the week's activities, so that each group may be apprised of what every other group has done. It may be well to devise a progress chart to be posted at this time. The Research and Development team should be at the final design revision stage and be moving into prototype work. Each group will have become sensitized to the total production task; design will have been studied and revised for the work pieces to be handled properly with the equipment available; and the task of building a prototype while perfecting the design of jigs, fixtures and inspection procedures will have been discussed before the close of this class period.

Sixth Day. Finish prototype work, and prepare drawings for the Production Tooling (PT) group. The instructor may find it necessary to prepare demonstrations of tools and processes for the Research and Development team's prototype work. Prototype and drawings should be ready to turn over to the Production Tooling team. In all preliminary planning the instructor should make use of all willing class members to assist the Research and Development team in accordance with their abilities in prototype planning and drawing work. The team approach would be desirable among disadvantaged youth.

Seventh Day. Continue Production Tooling group work on tooling devices; work should proceed from a study of the prototype and the production drawings. The instructor works with all groups as deemed necessary. All teams, in turn, can now examine the drawings and model product, in order to accumulate equipment to proceed with their individual tasks. For disadvantaged youth with limited experience and frustrations stemming from early deprivations in social and cultural experiences, the teacher will necessarily have many of the most difficult tasks laid out or completed. To lose sight of student participation in planning, however, would add further complications to their feeling of inadequacy.

Eighth Day. Instructor and the Production Control (PC) team discusses the problems of the proposed production line with the class. In like manner, he and the Quality Control (QC) group explain their problems with each work piece and the test of its reliability.

Ninth Day. This period is spent, in turn, with the presentations of (1) Production Management (PM), (2) Manufacturing (MF) and (3) Marketing (MK) teams to develop their responsibilities. Each group presentation will be led either by the teacher, his assistant or one of the more outgoing members of the group.

Tenth Day. A review of the week's work, and an examination of the relevancy of the plans and procedures, including demonstrations based on reading, investigations and research topics selected by the students earlier.

Eleventh Day. Class work. Team members should review the reference materials, the drawings and have invited guests view their project and make suggestions. They should go to any resource for assistance, including several visits to industry during the next three days. The teams should be working on a final revision of their proposed activities, pursuing their particular individual research and advising the other teams as requested. Decision making would come from the entire class, not just one group as is often done in industry. The purpose here would be to allow each participant to get experience in all of the activities of the various industrial divisions involved in production planning and marketing.

Twelfth Day. Continue above work.

Thirteenth Day. Continue above work.

Fourteenth Day. Continue above work.

Fifteenth Day. Evaluation session. Production Management group, working with the Production Control group, will identify the kinds and numbers of production line workers necessary. Identification of positions to be filled in reference to the numbers and abilities in class will be made.

Sixteenth Day. The PM group with instructor will discuss job descriptions and training programs for production workers. Job training will commence, with instruction being given to selected key workers.

Seventeenth Day. PC team with instructor to evaluate production line procedures and discuss with class. Problems of materials flow, and tool/machine location should be examined and discussed. Training of individual workers continues.

Eighteenth Day. PT team will have designed, tested and perfected the tooling devices. Trials should be made at this time and any required product design changes should be cleared with the RD group in consultation with the entire class.

Nineteenth Day. Instructor should present with MK a review of packaging, advertising and distribution schemes. Demonstrations should be given and discussed.

Twentieth Day. An additional visit to a local industry. This may have to take place on a Saturday. If a visit is not possible, a good industrial film should be shown, with a discussion of how the functions of the individual teams are reflected in the film.

Twenty-first Day. Instructor and one person from each team review the refined outlines of the entire class production activity. Each phase of the work will be summarized, in preparation for a trial run to commence the next day. All systems will have been tested out and validated this day.

Twenty-second Day. Trial operation period. Set up production line, proceed with production of a limited number (5 or 6) of the products or the parts therein. Examine each production phase (PC, QC, PM and MF) for faults and possible improvements.

Twenty-third Day. Continue trial operation. Second day of trial run.

Twenty-fourth Day. Continue trial operation. Last day of trial run.

Twenty-fifth Day. Check all systems: make final preparations for the production activity to begin on the next day.

Twenty-sixth Day. Mass production activity. All systems, "Go."

*Twenty-seventh Day.   Production activity.

*Twenty-eighth Day.   Production activity.

*Twenty-ninth Day.   Production activity.

*Thirtieth Day.   Production activity.

*Thirty-first Day.   Production activity.

*Thirty-second Day.   Production activity.

*Thirty-third Day.   Production activity.

*Note: This period is variable, as dictated by the time required to complete the production work.

Thirty-fourth Day. Critical evaluation of the activity. Have a cost accountant or economist (from industry or the school) come in and evalu-

ate the program from an economic point of view. Prepare, as a special student activity, problems for solving in accounting. Have problems ready beforehand. Prepare a cost analysis of the manufacturing activity.

Thirty-fifth Day. Continue evaluation, with suggestions for how the scheme could have been improved. Make frequent references to how industry would have performed the same operations.

Thirty-sixth Day. Class analysis and review of the marketing scheme. Discuss possible improvements in this. Plan an exhibit of the manufacturing activity. elect a suitable area in the school and prepare charts, diagrams, etc. which accurately display the main features of the program. A student group can spend some time outside of class and each period working on an exhibit.

Thirty-seventh Day. Consider the ways in which articles were produced in previous centuries. Compare this with the methods employed in class, and make generalizations regarding the availability of products, and prices, as they relate to increasingly efficient production systems. React to some of the individual "theme" papers on findings of individual class members.

Thirty-eighth Day. Examination and Evaluation period.

Thirty-ninth Day. Discussion of Examination and Evaluation period.

Fortieth Day. Final lecture-discussion: Production and the Technological Society.

The Instructional Facility

The manner in which a proper physical setting contributes to educational achievement cannot be emphasized strongly enough. The positive nature of environment and atmosphere have long held a significant position in learning theory; these same thoughts can quite logically be extended to planning a suitable laboratory for a manufacturing activity. Ideally, a shop should be available which offers the broadest possible facilities for working with tools, machines, materials, and ideas. The more limited the facility, the more limited the nature of the learning experience; but even here, learning can take place.

It is quite beyond the scope of this chapter to make precise listings of tools and equipment, space requirements, materials and instructional resources. Instead, some suggested guidelines are offered, in order to account for the broad range of differences and deficiencies which obviously exist due to regional and educational disparancies.

A comprehensive *general shop,* which includes facilities for working in wood, metal, plastic, electricity, graphic arts and

power is ideally suited to the study of the manufacturing industries. This provides for study and involvement without the limitations accruing to a shop planned for the study of a specific material-instructional area such as woodwork or metalwork. Such a facility encourages student investigation into broad areas of inquiry, and imposes few restrictions upon the scope of this investigation. Space in excess of standard requirements is desirable. This should extend from 250 to 500 percent of average space provided for this type of shop.

The *unit shops*, however limited, can serve as excellent vehicles for a penetrating examination into a specific area, such as plastics. Because unit laboratories are limited to one material field, they are frequently better equipped to offer to students an opportunity to gain a deeper understanding of how these kind of products are manufactured. Again the space needs are far greater than average.

The traditional attitudes regarding the sanctity of the classroom impose definite restrictions upon learning. This has been discussed earlier, but it bears repeating here. In order to study manufacturing properly, the community must become the classroom. Students should visit shops, talk to workers, consult engineers and technicians, and experience the noise, the smells, the confusion and the efficiency of a factory. They should pursue their studies by using libraries and talking to other teachers; in short, they should be encouraged to make use of every imaginable resource.

Teachers should make use of mobile systems in their shops to facilitate the establishment of production lines. Movable machines, benches, carts, conveyors and the like should be available in abundance where practicable to offer a more convenient production system. This requires much extra storage for equipment temporarily not in use for specified periods of time. This is not to say that every industrial arts shop should become a typical manufacturing industry; instead, every industrial arts shop should be planned as flexibly as possible to facilitate learning in an atmosphere influenced greatly by factory procedures.

Each shop should have an adjoining study-research room, wherein are located interesting reference books, magazines, charts, models, films and other audio-visual aids, adapted particularly for disadvantaged student use. They should be considered

as learning resources which students can use by themselves, without requiring the presence of the teacher. It is obvious that the study of industries is a vast topic; no teacher and no book can possibly contain all of the necessary or helpful information. Many industries do produce pictures and much low-level reading material for advertising purposes. By providing a broad range of interesting and useful resources, the student can engage in meaningful study.

References

Books and Booklets

1. Fierer, John L., and John R. Lindbeck, *General Metals*. Peoria, Illinois: Chas. A. Bennett Publishing Co., Inc., 1965.

2. Gerbracht, Carl, and Frank E. Robinson, *Understanding America's Industries*. Bloomington, Illinois: McKnight & McKnight Publishing Company, 1962.

3. Industry and the American Economy Series:
   The Growth of American Industry; Our Native Land; A Comparison of Three Economic Systems; Capital and Economic Growth; Industrial Research and Development; Industry-Organization and Employees; The Role of Competition; The Role of Marketing; Wages and Prices in an Industrial Economy; Industry's Profits. New York: The National Association of Manufacturers, 1962.

4. Kettering, Charles F., and Allen Orth, *America's Battle for Abundance*. Detroit: General Motors Corporation, 1955.

5. Lewis, Arthur O., Jr., *Of Men and Machines*. New York: E. P. Dutton and Co., Inc., 1963.

6. Lindbeck, John R., and Irvin T. Lathrop, *General Industry*. Peoria, Illinois: Chas. A. Bennett Publishing Co., Inc., 1968.

7. Oliver, John W., *History of American Technology*. New York: The Ronald Press Company, 1956.

8. *The Evolution of Mass Production*. Dearborn, Michigan The Ford Motor Company, 1956.

9. Walker, Charles R., *Modern Technology and Civilization*. New York: McGraw-Hill Book Company, Inc., 1962.

10. Watson, Gordon, Ed., *Production Handbook*. 2nd Edition. New York: The Ronald Press Company, 1959.

11. Weeks, Robert P., Ed., *Machines and the Man: A Sourcebook on Automation*. New York: Appleton-Century-Crofts, Inc., 1961.

12. Wilkie, Leighton, *Productivity* (charts and booklets). Des Plaines, Illinois: The Do All Company, 1961.

Films

1. *A Time Like This* — 28 Minutes, Free
   Modern Talking Pictures, 3 East 54th Street, New York, New York 10022

2. *Age of Specialization* — 13 Minutes, $2.75
   University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan

3. *American Industry — Past and Present* — 13½ Minutes, Free
   Film Service, National Association of Manufacturers, 277 Park Avenue, New York, New York 10017

4. *Automation Comes of Age* — 16 Minutes, Free
   United States Industries, Inc., Production Machine Division, 6499 West 65th Street, Chicago, Illinois

5. *Automation — What Is It?* — 13½ Minutes, Free
   Film Service, National Association of Manufacturers, 277 Park Avenue, New York, New York 10017

6. *Basic Elements of Production* — 13 Minutes, $2.75
   University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan

7. *Factory: How a Product Is Made* — 14 Minutes, $4.50 Color
   University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan

8. *For Beauty and Use* — 13½ Minutes, Free
   Film Service, National Association of Manufacturers, 277 Park Avenue, New York, New York 10017

9. *Fundamentals of Quality Control* — 16 Minutes, Free
   Maynard Research Council, Inc., 718 Wallace Avenue, Pittsburgh, Pennsylvania

10. *Industrial Research — Key to Jobs and Progress* — 13½ Minutes, Free
    Film Bureau, National Association of Manufacturers, 2 East 48th Street, New York, New York

11. *Invention in America's Growth 1750-1850* — 11 Minutes, $2.25
    University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan

12. *Invention in America's Growth 1850-1910* — 11 Minutes, $2.25
    University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan

13. *It's Your Move* — 24 Minutes, Free
    Modern Talking Picture Service, 3 East 54th Street, New York, New York 10022

14. *Materials Control* — 10 Minutes, $2.15
    Visual Aid Service, University of Illinois, Champaign, Illinois

15. *Material Handling Methods* — 27 Minutes, Free
    Maynard Research Council, Inc., 718 Wallace Avenue, Pittsburgh, Pennsylvania

16. *Men Who Changed the World* — 11 Minutes, $2.25
    University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan
17. *Precision Toolmaking and Machining* — 25 Minutes, Free
    Modern Talking Pictures, 3 East 54th Street, New York, New York 10022
18. *Product Development* — 11 Minutes, $2.15
    Visual Aids Service, University of Illinois, Champaign, Illinois
19. *Profit Through Industrial Design* — 16 Minutes, Free
    Maynard Research Council, Inc., 718 Wallace Avenue, Pittsburgh, Pennsylvania
20. *Quality Control* — 10 Minutes, $2.15
    University of Illinois, Visual Aids Service, Champaign, Illinois
21 *Quality Control by Statistical Methods: Acceptance Sampling* — 17 Minutes, $2.65
    Visual Aids Service, University of Illinois, Champaign, Illinois
22. *Quality Control by Statistical Methods: Process Control* — 17 Minutes, $1.65
    Visual Aids Service, University of Illinois, Champaign, Illinois
23. *Quality in Quantity* — 13½ Minutes, Free
    Film Services, National Association of Manufacturers, 277 Park Avenue, New York, New York 10017
24. *Seven Guideposts for Good Design* — 20 Minutes, Free
    DeRochemont Association, Film Library, 267 West 25th Street, New York, New York
25. *Technological Development* — 30 Minutes, $5.25
    Film Service, National Association of Manufacturers, 277 Park Avenue, New York, New York 10017
26. *Technology and You* — 13 Minutes, $4.50
    University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan
27. *The Land of Promise* (Labor and Production) — 28 Minutes, Free
    The Princeton Television Center, Inc., Princeton, New Jersey
28. *The Man on the Assembly Line* — 27 Minutes, $5.50
    University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan
29. *The Rogue* — 30 Minutes, Free
    Ford Film Library, The American Road, Dearborn, Michigan 48121
30. *The Skilled Worker* — 27 Minutes, $5.50
    University of Michigan, Audio-Visual Education Center, Frieze Building, Ann Arbor, Michigan
31. *The Story of the Cutting Edge* — 60 Minutes, Free
    Film Department, Do All Company, 254 North Laurel Avenue, Des Plaines, Illinois 60016
32. *The Story of Productivity* — 32 Minutes, Free
    Film Department, Do All Company, 254 North Laurel Avenue, Des Plaines, Illinois 60016

Individual Research Topics in Manufacturing

1. New Techniques in Materials Processing
    a. Explosive Forming
    b. Magnetic Forming
    c. Spark Forming
    d. Gas Forming
    e. Electroforming
    f. Ultrasonic Machinery
    g. Chemical Milling
    h. Lasers and Masers
    i. Pressure Curtain Coating
    j. Electrostatic Spraying
    k. Powdered Metallurgy
    l. Vinyl Coating
    m. Electrochemical Machining
    n. Electron Beam Welding
    o. Metal Spraying
    p. Full-mold Plastic Pattern Casting
2. Numerical Control in Machine Tools
3. Automation in Selected Fields
4. Problems of Worker Displacement
5. The Society of the Future
6. The Aerospace Industries
7. The Future of Industry
8. The Problem of Increased Leisure
9. Man or the Machine — A Study of Values
10. Must Men Work?

Suggested Mass Production Projects

1. Small Tables
2. Desk Lamps
3. Jewelry Boxes
4. Book Racks
5. Drafting Supply Cases
6. Tote Boxes
7. Shoe Shine Kit
8. Pencil Boxes
9. Desk Note Pads
10. Greeting Cards

Special Interest Families:
Construction Industries

DANIEL L. HOUSEHOLDER

The construction industries are of major importance to all American citizens. When one considers the magnitude of man's efforts to provide housing, buildings of other types, streets, highways, bridges and harbors, it is apparent that one of civilization's most fundamental tasks is to modify the environment to obtain a higher level of living, a better mode of being. Each individual is in constant interaction with the products of the construction industries in his daily activities at home, at work, at school, during recreation and in traveling from one of these activities to another. It is therefore imperative that each individual attain the fullest possible understanding of this area of industrial activity if he is to understand his culture, his society and his environment.

Economic conditions in our society impose direct effects upon the construction industry; the industry, in turn, exerts substantial influence upon overall economic health. The events of recent years have indicated that the interdependence of construction and the total economic system is so close that the gross national product may be accurately predicted from the number of housing starts. The economic impact of construction penetrates all facets of the society, including all disadvantaged groups, although the specific influence may not always be readily apparent to the uninitiated observer. Disadvantaged people, in particular, need housing and could probably relate more easily to the activity asociated with building construction. Many have seen, even if they have not benefited from, buildings under construction.

Our constructed environment of buildings, streets and highways determines, in large measure, the quality of living which may occur in the setting. It is perhaps more accurate to state that the environment created by the construction industries im-

poses maximum levels for the quality of human experience which may take place within the area. While it would be difficult to develop an absolute proof for this thesis, it can be argued, for instance, that stereophonic sound is not a fully meaningful experience in a hovel, that the interstate highway system is a contemporary cultural necessity, that dietary planning is useless without adequate facilities for food preparation and that proper rest is impossible without physical protection from the elements during much of the year in most areas of the United States. Continued progress in the construction industries is therefore a prerequisite to environmental improvement for the disadvantaged.

The construction industries assume several roles in the education of disadvantaged youth. In the first place, all youth, as a part of their general education, need to understand the construction industries as a part of our economy and our culture. Second, the construction industries offer a diversity of occupational opportunities for disadvantaged youth; they need to become aware of these opportunities, the roads to employment in the occupations and their individual aptitudes and interests for the various construction occupations. Third, the construction industries are the primary source from which the disadvantaged may hope to attain a better life for themselves and their children. In almost all cases, the improvement of the quality of life for the disadvantaged youth begins with an improvement in housing. Increased income may not always be necessary to obtain better housing; however, the problem of adequate housing for low-income families remains one of the most persistent riddles of the construction industry. The disadvantaged must hope for and work toward substantial improvement in the quality of housing. Educational, commercial and industrial construction are also desperately needed in areas where the disadvantaged are concentrated; without these improvements, many of our urban areas are destined to remain blighted for decades to come.

Occupational Opportunities

The construction industries provide job opportunities for millions in a diverse array of occupations, ranging from the most commonplace to the most dignified. Perhaps no other industrial group offers a greater diversity of opportunity for the development of individual involvement and talent to attain independence

and improved income levels. Somewhere within the multitude of opportunities, almost anyone may find an occupation, a job cluster or a range of occupational opportunities intrinsically interesting to him, and one where he has a reasonable probability of success.

In writing outlines for the disadvantaged, one is tempted to include only the operations included in semiskilled and skilled occupations; this would be a serious error. Scientific, managerial, engineering and technical occupations are found in all parts of the construction industries. In most cases, these occupations, as well as skilled and semiskilled occupations, require understandings and competencies of the types implied in the outlines below. They will, of course, also require the occupational preparation common to their levels of sophistication. Foundational responsibilities, competencies and knowledges associated with the construction industry are somewhat common.

Outline Organization

In constructing the outline below, an attempt was made to utilize a functional, realistic pattern of organization. Where it has been possible to identify practical systems of categorization which have superceded the traditional divisions of the skilled trades, the new patterns have been used. It is felt that the use of the trade-oriented organizational pattern would be a particularly questionable one if used with disadvantaged learners.

The basic pattern in the outline is sequential, beginning with the planning and organizational efforts which precede the actual construction. The emphasis is placed upon residential construction, though most of the points in the outline are applicable to light commercial construction as well. The construction process is followed through site preparation, concrete and masonry work, framing, exterior completion, the installation of insulation and mechanical systems, interior finish and trim, finishing, landscaping and maintenance. Construction trends and labor relations are also covered briefly.

Sincere appreciation is expressed to the staff of The Industrial Arts Curriculum Project, The Ohio State University, for providing the author a complete set of their preliminary instructional materials dealing with the construction industries. The materials have been most helpful in preparing the outline in-

cluded here; it is hoped that this chapter will be usable with the revised Industrial Arts Curriculum Project materials as these become available for general distribution.

The outline is an attempt to suggest some of the details of the construction industries which the teacher might consider in planning an instructional sequence for disadvantaged learners; it is not a course outline. The outline does not necessarily represent the "most logical" or "most highly refined" taxonomy or system of categorization, though it appears to be functional for the present purpose. Teachers are encouraged to enter the outline at any point and select those parts of the content which seem most appropriate for the scope and objectives of their courses. The needs, interests, and aptitudes of the learners must, of course, be determinants in the selection of content and activities.

I. Planning and Organizing the Construction Effort
  A. Area Planning — Land Utilization
    1. Agricultural
    2. Commercial
      a. Central business
      b. Shopping centers
    3. Industrial
      a. Light industry
      b. Heavy industry
    4. Residential
      a. Single-family
      b. Multiple-family
    5. Recreational
  B. Community Facility Requirements
    1. Educational
      a. Elementary schools
      b. Secondary schools
      c. Vocational-technical schools
      d. Colleges
    2. Transportation
      a. Streets
      b. Highways
      c. Railways
      d. Airports
      e. Waterways
    3. Utilities
      a. Water supply
      b. Sewer system

    C. Family Housing Decisions
        1. How much housing?
           a. Number of rooms
           b. Square footage
        2. Where?
           a. City
           b. Suburban
           c. Rural
        3. Type?
           a. Apartment
           b. Mobile home
           c. House
        4. Procurement?
           a. Rent or lease
           b. Purchase
           c. Build
           d. Remodel
    D. Selecting the Home Site
        1. Neighborhood selection
           a. Value stability
           b. Owner occupancy
           c. Street plans
           d. Services
        2. Lot selection
           a. Size and shape
           b. Topography and orientation
           c. Soil conditions
           d. Adjacent uses
           e. Utilities
        3. Legal considerations
           a. Boundaries
           b. Deed restrictions
           c. Zoning and setbacks
           d. Taxes and assessments
           e. Easements
           f. Title and abstract
    E. Planning for a New Home
        1. Family requirements
           a. Rooms
           b. Interior arrangement
           c. Traffic pattern
           d. Kitchen placement
           e. Sound conditioning
        2. Planning assistance
           a. Architect
           b. Stock plans
           c. Model homes

    3. Preparing plans
        a. Working drawings
        b. Specifications
    4. Selecting a contractor
        a. Reputation
        b. Size
        c. Bids
        d. Subcontracting
F. Financing
    1. Construction loans
    2. Mortgages
        a. FHA-VA
        b. Conventional
    3. Comparative costs
        a. Terms
        b. Interest rates

II. Preparing the Construction Site
    A. Removal Operations
        1. Demolition
        2. Salvage
        3. Moving
        4. Protective measures
    B. Surveying
        1. Setting up the level-transit
        2. Determining property boundaries
        3. Laying out building lines
        4. Determining elevations
    C. Earthmoving
        1. Excavating
        2. Trenching
        3. Dredging
        4. Grading

III. Concrete Work
    A. Materials
        1. Portland cement and modifications
        2. Aggregates
        3. Water
        4. Admixtures
    B. Properties
        1. Fresh concrete
            a. Workability
            b. Consistency
            c. Bleeding
            d. Stiffening
            e. Setting
            f. Air-entrainment
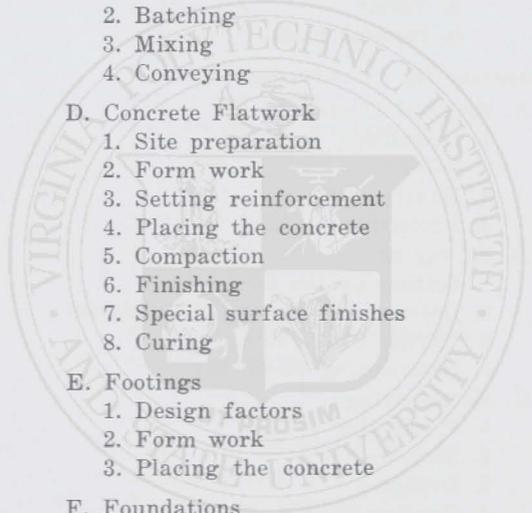
    2. Cured concrete
      a. Strength
      b. Permeability
      c. Durability
      d. Volume change
      e. Creep
      f. Fire resistance
    3. Materials testing procedures
      a. Slump tests
      b. Compression tests
      c. Bending tests
      d. Penetration tests

C. Manufacture of Concrete
    1. Proportioning
    2. Batching
    3. Mixing
    4. Conveying

D. Concrete Flatwork
    1. Site preparation
    2. Form work
    3. Setting reinforcement
    4. Placing the concrete
    5. Compaction
    6. Finishing
    7. Special surface finishes
    8. Curing

E. Footings
    1. Design factors
    2. Form work
    3. Placing the concrete

F. Foundations
    1. Design factors
    2. Form work
    3. Placing the concrete
    4. Waterproofing

G. Specialized Applications
    1. Piers
    2. Prestressed beams
    3. Commercial construction
    4. Highways
    5. Bridges

H. Weather Protection
    1. Heat
    2. Cold
    3. Precipitation

IV. Masonry
    A. Mortars
        1. Materials
            a. Cements
            b. Aggregates
            c. Water
            d. Colors
        2. Preparation
            a. Proportions
            b. Mixing
    B. Brick Masonry
        1. Bricks
            a. Types
            b. Sizes
            c. Characteristics
        2. Bonds and patterns
        3. Wall work
            a. Corners
            b. Arches
            c. Lintels
            d. Parging
            e. Veneer
        4. Chimneys
            a. Components
            b. Design
            c. Procedures
        5. Fireplaces
            a. Types
            b. Design
            c. Procedures
    C. Concrete Masonry
        1. Masonry units
            a. Shapes
            b. Sizes
            c. Surface finishes
            d. Applications
        2. Construction details
            a. Bonds
            b. Wall patterns
        3. Block laying procedures
            a. Corners
            b. Walls
            c. Mortar placement
            d. Reinforcement
            e. Joint treatments

      D. Stone Masonry
        1. Materials
          a. Sizes
          b. Types
          c. Surface finishes
          d. Applications
        2. Procedures
          a. Bonds
          b. Reinforcement
          c. Joint treatment

V. Wood-Frame Construction
    A. Framing Lumber
      1. Sizes
      2. Grades
      3. Species
    B. Sheathing and Subflooring
      1. Plywood
      2. Composition
      3. Insulating
    C. Framing System
      1. Balloon
      2. Platform
      3. Modular
    D. Floor Framing
      1. Layout
      2. Girders
      3. Sills
      4. Joists
      5. Bridging
      6. Subflooring
    E. Wall Framing
      1. Layout
      2. Plates
      3. Studs
      4. Corners
      5. Rough openings
      6. Sheathing
    F. Ceiling framing
      1. Layout
      2. Joists
      3. Bridging
    G. Roof Framing
      1. Types
      2. Layout
      3. Common rafters
      4. Hips

B. Heating Systems
 1. Types
  a. Forced air
  b. Hydronic
  c. Electric
 2. Installation
  a. Planning
  b. Equipment location
  c. Connections
  d. Controls
  e. Balancing
  f. Maintenance
C. Cooling Systems
 1. Types
  a. Room
  b. Central
 2. Installation
  a. Planning
  b. Air distribution
  c. Controls
  d. Packaged systems
D. Air Quality Systems
 1. Exhaust systems
  a. Location
  b. Installation
 2. Ventilation systems
  a. Types
  b. Installation
 3. Filtration systems
  a. Types
  b. Installation
E. Elevators
 1. Types
  a. Freight
  b. Passenger
  c. Escalator
 2. Installation
  a. Planning
  b. Location
  c. Maintenance
F. Plumbing Systems
 1. Principles
  a. Hydraulics
  b. Pneumatics
 2. Water supplies
  a. Wells
  b. Municipal systems

3. Materials and equipment
   a. Fixtures
   b. Pumps
   c. Tanks
   d. Valves
   e. Faucets
   f. Pipes
4. Building piping systems
   a. Water supply
   b. Drainage
   c. Interior fire protection
   d. Gas supply
5. Water treatment
   a. Softening
   b. Waste treatment
G. Electrical Systems
   1. Planning
      a. Lighting
      b. Outlets
      c. Switches
      d. Circuits
      e. Overcurrent protection
      f. Service entrance
   2. Wiring systems
      a. Residential
      b. Commercial
   3. Installation procedures
      a. Lighting circuits
      b. Appliance circuits
      c. Power circuits
      d. Audio systems
      e. Signal systems
IX. Interior Finish
   A. Wall and Ceiling
      1. Covering materials
         a. Gypsum drywall
         b. Plaster
         c. Paneling
         d. Plywood
         e. Acoustical tile
         f. Ceramic tile
      2. Selection factors
         a. Cost
         b. Durability
         c. Availability
      3. Installation
         a. Procedures
         b. Precautions

B. Floors
    1. Covering materials
        a. Hardwood
        b. Sheet materials
        c. Resilient tile
        d. Ceramic tile
        e. Slate
        f. Carpeting
    2. Selection factors
        a. Cost
        b. Durability
        c. Availability
    3. Installation
        a. Procedures
        b. Precautions
C. Interior Trim
    1. Stairs
        a. Parts
        b. Construction
        c. Trimming
    2. Doors
        a. Fitting
        b. Hanging
    3. Moldings
        a. Base
        b. Casing
        c. Cove
        d. Cornice
        e. Joinery
    4. Hardware items
        a. Selection
        b. Installation
    5. Fixtures and accessories
        a. Base cabinets
        b. Counter tops
        c. Wall cabinets
        d. Vanities
        e. Ranges
        f. Miscellaneous
X. Finishing
    A. Color
        1. Properties
        2. Selection
    B. Coatings
        1. Materials
            a. Paints
            b. Enamels
            c. Lacquers

      d. Varnishes
      e. Shellacs
      f. Thinners
      g. Stains
      h. Removers
      i. Fillers
      j. Waxes
      k. Bleaches
      l. Polishes
      m. Adhesives
    2. Application procedures
      a. Brushing
      b. Spraying
      c. Aerosol spraying
      d. Rolling
      e. Dipping
  C. Wallpapering
    1. Estimating
    2. Preparing the wall surface
      a. Removing old paper
      b. Patching plaster
      c. Sizing surfaces
    3. Application
      a. Pasting
      b. Trimming
      c. Starting the job
      d. Corners
      e. Ceilings

XI. Landscaping
  A. Development of Landscaping Plan
    1. Lot characteristics
      a. Size
      b. Shape
      c. Grade
      d. Building placement
    2. Building characteristics
      a. Architectural style
      b. Proportion
      c. Exterior materials
    3. Selection of plantings
      a. Trees
      b. Shrubs
      c. Hedges
      d. Grasses
      e. Flowers

    4. Constructed structures in landscape design
      a. Paved areas
      b. Steps
      c. Fences and screens
      d. Planters

B. Landscaping Procedures
    1. Scheduling
    2. Grading
    3. Structures
    4. Lawn areas
      a. Seeding
      b. Sodding
    5. Planting

C. Maintenance of planting areas
    1. Watering
    2. Feeding
    3. Weeding
    4. Pruning
    5. Mowing

XII. Building Maintenance
  A. Exterior Maintenance
    1. Concrete
      a. Patching cracks
      b. Waterproofing
    2. Walls
      a. Repainting
      b. Siding repair
    3. Roofs
      a. Patching leaks
      b. Tuckpointing chimneys
      c. Cleaning gutters and downspouts
    4. Windows and doors
      a. Glass cleaning
      b. Replacing glass
      c. Adjusting operation
      d. Weatherstripping
      e. Caulking

  B. Interior Maintenance
    1. Refinishing
      a. Walls
      b. Floors
      c. Furniture
    2. Electrical repairs
      a. Troubleshooting
      b. Component replacement
      c. Appliance repair

3. Plumbing repairs
   a. Faucet
   b. Water closet
   c. Clogged drains
   d. Leaks
   e. Condensation

XIII. Construction Trends
   A. Materials
      1. Modifications
         a. Processed woods
         b. Plastics
         c. Metals
      2. New applications
         a. Metals
         b. Plastics
   B. Procedures
      1. Unit standardization
         a. Modules
         b. Framing systems
      2. Prefabrication
      3. Factory construction
         a. Components
         b. Mobile homes
         c. Townhouse apartments

XIV. Labor Relations
   A. Trade Unionism
      1. History
      2. Contemporary unions
         a. National
         b. Local
   B. Functions of Unions
      1. Collective bargaining
      2. Instruments of power
   C. Contract Provisions
      1. Wages
      2. Hours
      3. Working conditions
      4. Fringe benefits
   D. Labor Legislation
      1. Safety requirements
      2. Wage and hour legislation
   E. Employer-Employee Relations
      1. Hiring
      2. Personnel policies

Implementation

If one is to teach disadvantaged youth about the construction industries, he must provide appropriate facilities, organize courses to meet the needs of the youth, obtain the services of a competent teacher and develop a high degree of cooperation from organized labor and other community groups. Careful attention to the planning and operation of the instructional endeavor will yield substantial learning dividends. A few pertinent suggestions are offered in this section.

Facilities

Large areas of open, uncluttered space are a fundamental facilities requirement for teaching about the construction industries. Student activities which may be anticipated in the construction unit or course require substantial floor areas for their accomplishment. Therefore, the usual expectations for aisles, space between and among equipment items and areas for the assembly of student products should be substantially increased, where adequate laboratory space is available.

Flexibility is an important guideline in facilities planning, since a number of types of activities will need to occur in a given floor space during the course. The number of fixed features in the open area should be held to an absolute minimum. Electrical services, exhaust systems, and other utilities should be located around the perimeter of the area, with overhead extensions where these seem appropriate. Portable equipment should be used in preference to fixed equipment, and folding partitions should be specified where they may be used in lieu of permanent walls.

While the ideal facility for teaching about the construction industries would be a large open space adjacent to an outdoor area suitable for class activities, it is also important to consider the modification or miniaturization of activities which will permit the teacher to introduce instruction about construction in existing facilities. Certainly there should be no tendency to defer teaching about construction until a large new laboratory is available. The need for such instruction is urgent, and every attempt should be made to proceed — using available facilities and the facilities of the construction projects in the neighborhood as a living laboratory. Models for project work and role playing should take a prominent place in this family of industrial endeavor.

Courses

An introductory, overview course covering the entire range of construction activities, supplemented by additional courses concentrating upon specific areas in construction, would probably constitute the idealized educational program dealing with the construction industries. However, it is necessary to deal with contemporary reality in the education of the disadvantaged; such an idealized environment rarely occurs. As a consequence, one may well compromise, with a short unit on construction in a general industrial arts course. Certainly such brief coverage is better than to ignore the more basic construction facets entirely. A careful selection of representative activities and content can present a highly valuable sample of experiences to young people in a very short time.

A one-semester or one-year course in the construction industries would seem to be a reasonable goal for many school systems. With such a time period available, it is possible to provide a broad sample of experiences with enough depth of penetration to assure that most students develop satisfactory general and exploratory understandings. Such a course could hardly be considered to be vocational, yet it should contribute substantially to each student's self-perception, and might well provide a foundation for future vocational development, either in subsequent courses or in on-the-job experiences.

The best compromise in content selection, course objectives and learners to be served must be determined in each situation. Educators must be alert to contemporary developments, since adequate guidelines have not yet been formulated to determine the specifics of a course in construction with any degree of certitude.

Teachers

The one most influential ingredient of any educational enterprise is the teacher; the teacher of a course dealing with the construction industries is no exception. He needs an especially broad range of competencies, including familiarity with contemporary materials and processes across the families of occupations and activities in the construction industries.

The teacher who attempts to portray the construction indus-
tries to disadvantaged students will, of course, need the general
competencies outlined in Chapter 4. While the breadth of the
construction industries complicates his task, the intrinsic in-
terest value of construction activities makes his teaching exper-
iences unusually satisfying. An abiding interest in young people,
a comprehensive basic understanding of construction and a pro-
fessional willingness to participate with his students in the
learning endeavor seem more important than any specific ex-
periences.

Community Support

It is to be expected that there should be substantial varia-
tion in construction courses from one community to another. To
some degree, this is entirely appropriate; building codes fre-
quently dictate construction variations which would obviously
be reflected in the content of local courses. Similarly, local avail-
ability of examples, materials and resource people may bias the
content selection in a specific direction. It is important to main-
tain some semblance of content balance in construction courses
designed to provide overview understandings; it is also impor-
tant to enlist community support of a new construction course.

As a consequence, educators responsible for courses and
programs dealing with the construction industries must be es-
pecially careful to involve interested groups within the commun-
ity. Advice and counsel should be sought from building contrac-
tors, labor unions and building material dealers. These groups
have a vested interest in the future of the construction industries
in the community and can be most helpful if they can be enlisted
as participating supporters of the program. Union participation
is particularly important. Leadership in the local unions should
be well informed about the purposes and methods of the courses
in the construction industries. Even though little, if any, voca-
tional preparation may be anticipated in the courses, it is impera-
tive that the local unions understand what is being done and sup-
port the educator's efforts. Disadvantaged youth frequently find
the construction unions one of their best sources of occupations.
This avenue must be kept open and well paved at all times.

Summary

This chapter has delineated some of the potential content which may be selected from the construction industries, and has included some suggested guidelines for the development of units and/or courses in the construction industries for disadvantaged youth. While existing industrial arts courses do not generally provide adequate coverage of the construction industries, there are indications of an increasing interest in this important content area; it is to be hoped that new course developments and revisions will include much more comprehensive instruction about the construction industries.

Relatively few current references deal directly with the development of industrial arts courses in the construction industries for disadvantaged youth, yet a number of valuable resource materials are available to assist interested educators. A highly selective listing of these materials is included as the bibliography of this chapter with the expectation that additional materials will be readily identified by the educator who consults these works in his library or publisher's catalog.

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CHAPTER NINE

Implications and Generalizations

RALPH O. GALLINGTON

In the first chapter of this yearbook, an identification of disadvantaged youth was made. The deprivation common to all disadvantaged people was described as an illness suffered by society. The school being an institution of society has great responsibility in correcting societal ills; however, the reduction of responsibility to that of the schools would be a reduction to absurdity. All citizens, elected officials and representatives of government are involved. Without the support of many facets of our society, the schools cannot hope to achieve much progress in meeting the needs of disadvantaged people.

It was established that there are many types of handicaps suffered by disadvantaged people, a multiplication of which complicates the diagnostic problem. Many handicaps may not be manifest, for example. For purposes of delineation, it was decided that this presentation would set forth what industrial arts might contribute most to ameliorate the lot of disadvantaged youth without physical or mental defects. Although persons with the latter defects have great and diversified disadvantages, it was decided that therapy and special education should not be introduced in this yearbook, except as they apply to the less complicated cases.

Although school dropouts are prevalent among disadvantaged youth, it was recognized that this ill of society extends beyond the disadvantaged population of our nation. Further, it was emphasized that many disadvantaged youth persist in school until high school graduation. A review of literature revealed that dropouts express a dissatisfaction with school almost universally. Whether those who persevere until high school graduation become dissatisfied with school is not known. It has been shown frequently by researches that the school curriculum does not relate to disadvantaged youth and their problems.

The growth of the inner city slums has brought unusual complications, including child exploitation and untimely child maturation to adult standards. The breakdown of the home and the absence of a father image often leads to a lack of wholesome values in the home and a lack of controls on the indulgence of children. Minority groups and ethnic entanglements have caused group hatreds and unwholesome competition in inner city communities. A lack of understanding on the part of teachers has led to the use of instructional materials unrelated to the learning environment.

The Teaching Challenge

Very little use has been made of handling "things" in classrooms or of reconstructing life experiences which are familiar to students in deprived communities. Industrial arts should be used to relate instruction to present-day life needs. Teachers with a background of understanding are needed to relate real life experiences to the classroom instruction. Disadvantaged youth themselves should be subsidized so they might become teachers in order that misunderstanding in the classroom between student and teacher might be overcome. Teachers trained primarily to teach middle-class society should be moved out of, or trained to teach disadvantaged youth in, disadvantaged communities. A special recruitment and selection procedure should be set up to procure dedicated teachers for disadvantaged communities.

The industrial arts teacher, as well as other teachers, must be accepted by the learner. He needs to be trained to assume his duties and responsibilities unafraid and confident. He needs the acceptance and support of other teachers; he must become a member of a teaching team relating industry to all segments of other curricular offerings represented by other teachers on the team. Teachers should not underestimate the impact of their apparent attitude and concern for their students as they go about their teaching duties. Dropout-prone students often leave school because they think their teachers do not like them.

In preparing to teach industrial arts to disadvantaged youth, one should think rather realistically about meeting greatest needs first. Without a good introduction to these needs through internship assignments and other field experiences, the teacher cannot

understand the gravity of miscalculated acts. One serious mistake on the part of an unprepared teacher could cause him to lose forever the precious rapport with his students. Or an early mistake could destroy all chances of him ever developing a kindly relationship with them. With rather constant field experiences, the prospective teacher will be sensitized to his need for being prepared to deal with sociological, psychological and teaching problems. More than likely he, himself, will decide on further training and education to the extent that he becomes satisfied that he has the necessary knowledges and skills to succeed.

Team teaching in industrial arts as well as team teaching between subject-matter areas should be developed, especially in large classes. In some cases, larger classes might be more desirable if team teaching could be employed. This might apply particularly well in manufacturing such as described in Chapter Seven. Interaction between industrial arts areas, i.e., service, manufacturing and construction should be encouraged to develop among students as many industrial concepts as possible.

Chapters Five, Six, Seven and Eight all refer to the need for teaching industrial understandings somewhat remote from recommended industrial arts facilities. The mining, refining, manufacturing and processing of raw materials are examples of areas in which learning could be accomplished vicariously. The harvesting or reaping of biologicals and their refinement for use are other examples. Field trips have been recommended as well as movies, film strips and the like. Inner city youth in particular need to have many field trips to take them out of their common environment to see the miracles of science, agriculture and industry, including mining and other industrially related industries. This could be done very easily in cities where transportation is cheap and where science and industry abound. Industries especially supporting the " family" included in industrial arts should be visited actually or by film. Examples of such industries would be manufacturers of commonly used consumable supplies, tools and hardware. Related activity in fields such as research, design, engineering and chemistry would also be appropriate for such visitation.

Space Needs

The lack of modern school buildings has been mentioned in disadvantaged communities, especially in the inner city. It is recommended that adequate, clean and comfortable quarters be provided for all youth in school. In attempting to provide a realistic industrial environment in which industrial arts may be taught, this is essential. Industry provides for its workers safe (and as clean as practicable) working conditions. There should be adequate clean restrooms. Convenience to other school facilities and/or school transportation should be provided as well. This includes access to the school cafeteria, gymnasium, classrooms and the like. Personal hygenic facilities complete with showers should be provided for the health, cleanliness and safety of students. Some inner city communities have had schools surrounded by large abandoned stores and warehouses. In some communities these buildings have been completely renovated for industrial-type school instruction. This has required putting down good floors, repainting (with cleanliness and seeing as the objective), installing heating systems and refurbishing auxiliary spaces as needed. In this regard the inner city often has more of an opportunity to develop industrial arts facilities quickly than other, seemingly more desirable communities.

Not all store or warehouse buildings are easily adapted to industrial arts use. Many would require more money to be spent on renovations than the buildings themselves are worth. The total cost and the total value derived from such expenditures would have to be weighed to make wise decisions.

Some older buildings are multi-story structures which might require large freight elevators in order to facilitate receiving and shipping activities. In congested cities, it is doubtful that such space use would also include outside areas for class use in the instruction plan.

Authors handling the three families described in Chapters Six, Seven and Eight have referred to space needs. An appeal to authority has been suggested. In doing this, the planner will be guided by many principles which have been developed over the ensuing years. Generally, these principles are insufficient, largely

because they do not apply to specified space needs or a specific situation. The use of such principles is recommended, however. It is considered a good procedure by which one would avoid overlooking things on which decisions have to be made. Reading the available literature is recommended as the first step.

In the discussion of the manufacturing family, there was reference to using available space for various types of manufacturing. For example, a manufacturing enterprise involving many dissimilar materials might be handled in a *general* industrial arts shop. Conversely, manufacturing a product largely of one material could be accomplished satisfactorily in a so-called *unit* industrial arts shop. In manufacturing, as well as the other families, the key word for facilities is *versatility*. Walls should be movable as well as machines, benches and other heavy equipment used in the instructional task. Another important item is adequate *storage space.* Since industrial families have many component members and since several have to be included in order to give a more adequate experience within a family, some tools and other devices have to be stored and otherwise out of use periodcally. Further, there may be required a considerable amount of stockpiling of supplies in preparation for group project endeavor.

The above approaches to teaching the three families included in industrial arts lead one to the realization that a large open area or areas will be needed from time to time. This large area is common to all three and might be considered the focal point, although dominant in size, of all other activity within the family. Since all three seem to require a large open uncluttered area, it may be that there are other similarities as well as possible differences to consider.

Physical Facilities

The large open space in the industrial service family would be used for working on large "live" work such as objects which would conceivably come in under their own power. All work in this facility would be custom or specific job type assignments. Generally, the work would flow into a specific area of the facility and remain there until it was repaired or serviced. Afterwords, it would move out. Figure 7 illustrates a space use symbolic of the industrial service industries. No attempt has been

made to standardize space use in the facility. Again the word "versatility" takes precedence. And the walls may be moved!

One exceedingly important function of the large open space in manufacturing is the production and assembly lines. However, it is quite conceivable that certain smaller spaces could be utilized for "sub contracting" or preparing subassemblies of component units of the product. Along with manufacturing there
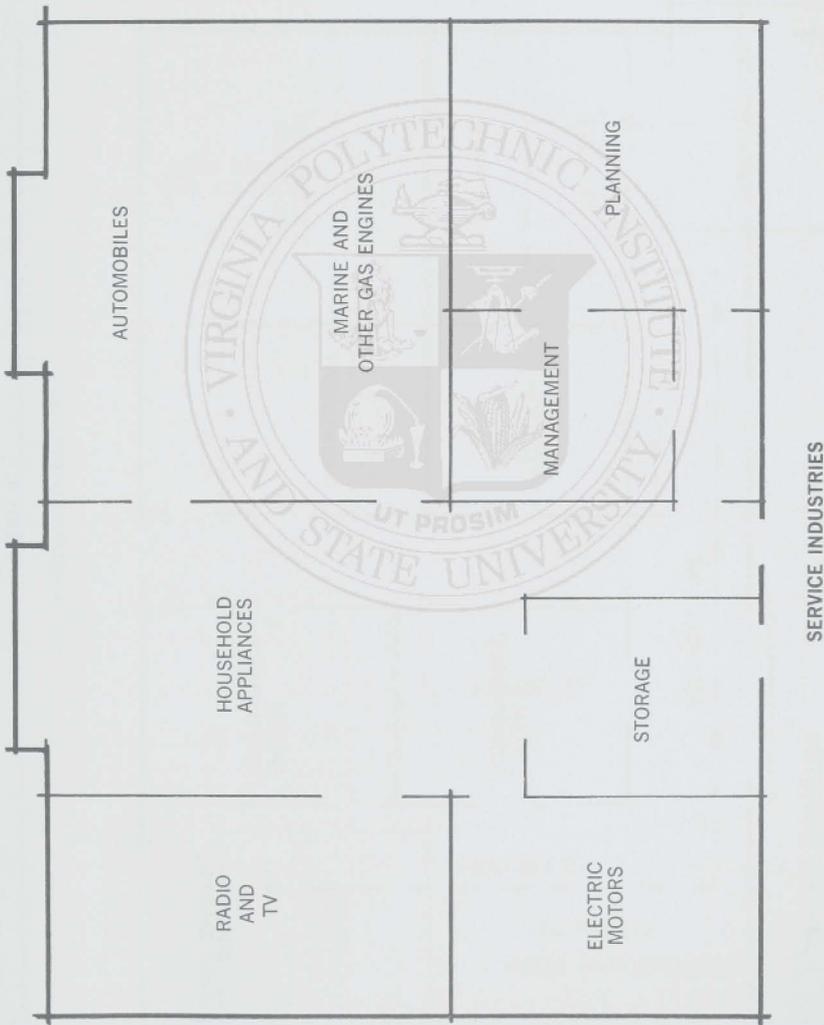
Figure 7.

are several supporting functions such as research and development, production planning and control, quality control, personnel management and product marketing. These functions would need to occupy space, and in some instances considerable space might be needed for short periods of time only. In such instances, versatile space could be used for setting the stage and for role playing for the short period of need. It then would be dismantled and
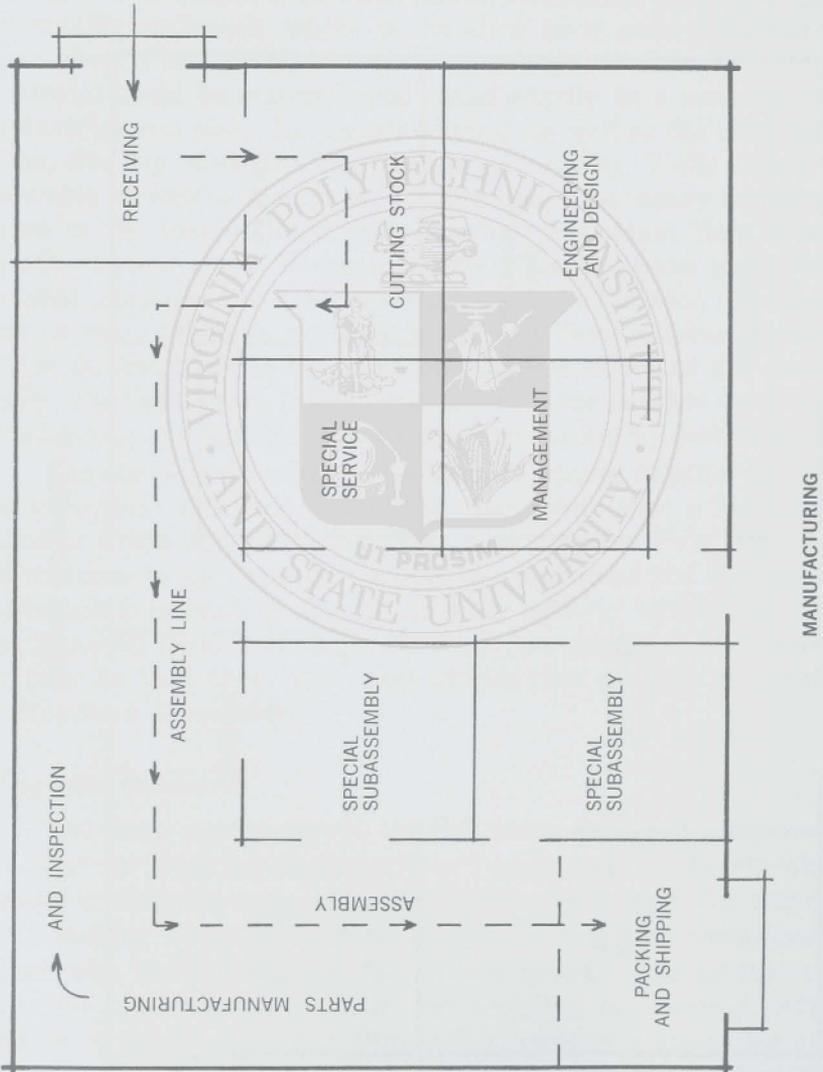
Figure 8.

used for something else as other equipment was rolled in to reset the stage. Figure 8 represents one symbolic use of space for a manufacturing endeavor.

Since the activity of the construction industries is involved with the on-site assembly of many minute parts into one whole, the large open area here might be used for making small models of large construction such as bridges, buildings, dams and the
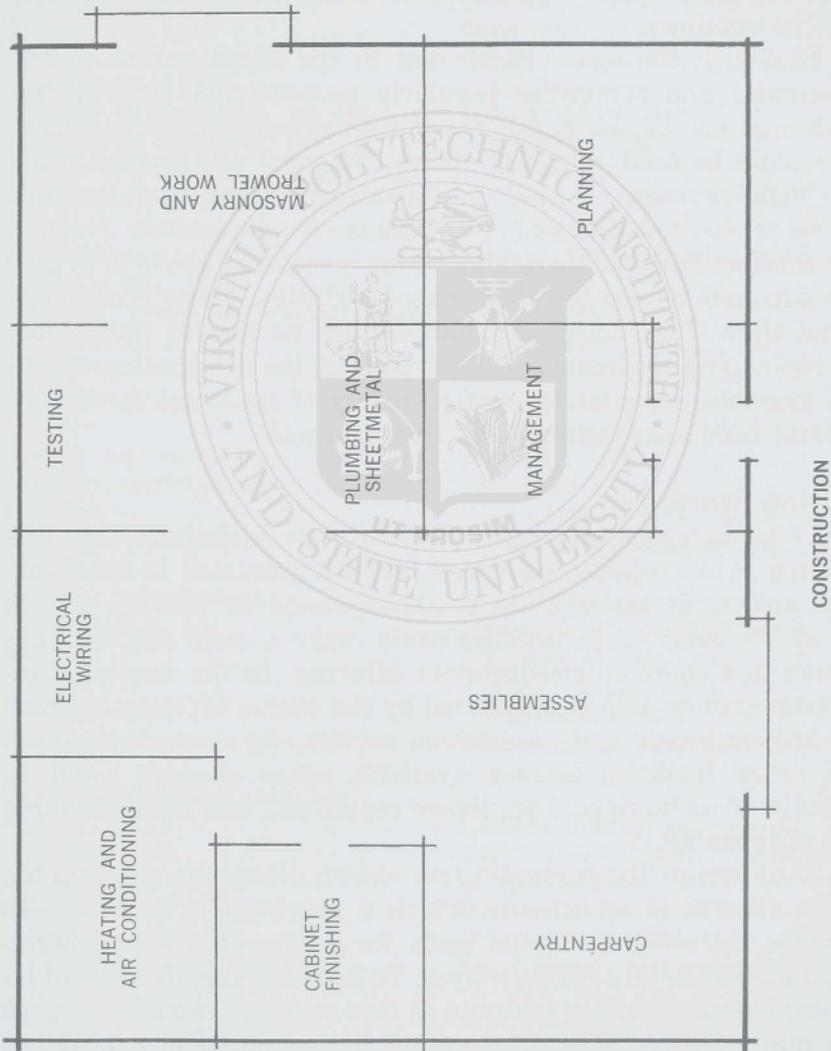
Figure 9.

like. It could be used also to make large unwieldy construction subassemblies such as trusses and wall sections to be used on the site outside of the shop facility. Experimentation and testing of large component parts could be done here by moving in test equipment as needed. Aside from the large open shop area there are special activity areas which could be "set-up" to facilitate the many facets of the construction industry. Figure 9 is another symbolic use of space. Again, this is one schematic illustration. With versatile space and movable walls other combinations could be obtained.

Basically, the space illustrated in the above schematics is rectangular and somewhat regularly proportional. This is the traditional use of space, but other wall arrangements and locations could be used. Circular spaces, diagonal and curved walls have disadvantages as well as advantages which must be considered when alterations of space use is contemplated.

Another facet of space allocations mentioned above is to provide adequate access to other school facilities. These schematics do not show this and other facilities such as shower rooms, locker rooms and restrooms. The purpose of the schematics was to give symbolic considerations to a variety of space use for the industrial families considered by this yearbook.

Getting Started

To provide the most essential and most basic industrial orientation in our schools, the three families presented in this yearbook are good starts. Even small segments or clusters within one of the basic three families could make a more abridged approach to a contemplated broader offering. In the family of industrial service, this is illustrated by the course offering in small gas engine repair and gas station service. As space, equipment and other facilities become available other clusters could be added such as household appliance repair and tool reconditioning and sharpening.

Any one of the many clusters shown occupying space in the above figures is an area in which a start could be made. To broaden the offerings would make for a more desirable achievement of industrial arts objectives. To broaden the offering to include all three families featured in this yearbook would approach the minimum required for meeting basic industrial arts objectives.

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