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INDUSTRIAL EDUCATION

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GENERAL RECOGNITION OF THE VALUE OF INDUSTRIAL EDUCATION

Industrial education in some form is as old as the industries themselves, but it has been only in the past dozen years that the public schools have undertaken in a serious way to incorporate courses in vocational industrial education in their program of studies. With the breakdown of the old apprenticeship system and with the growing realization of the need for some effective method of training to help the great army of industrial workers better and more quickly to adjust themselves to their life work, it was proposed to make it a responsibility of the public schools to offer at least some service in adjusting transition from school to work. The arguments for and against this proposition were the results of a difference of opinion between two social groups—the first believing that the purpose of public education was to contribute to culture and to the enjoyment of leisure and life satisfactions of the individual, and the second group holding that public education should emphasize vocational objectives and regard the development of the economic productive ability as worthy of attention.

Only during the past 10 years has the point of view of the believers in the social importance of effective vocational training of less than college grade resulted in a sufficient body of crystallized public opinion to support a widely diffused and highly developed program. Naturally, the rather sudden initiation of such a broad program was accompanied by acrimonious discussion and doubt as to its success on the part of many workers in the educational field. It is highly gratifying to note that during the past two years much of this discussion and confused thinking has ceased. There is an increasing tendency to regard the whole educational program as

conducted essentially for the purpose of promoting progress and stability of our democratic form of social organization. Much literature has appeared during the past two years that has directly or by implication set forth the conception that the ultimate standard by which any form of education must be measured and evaluated is the degree to which it contributes to effective adjustment in our form of social organization.

TYPES OF INDUSTRIAL WORK AND OBJECTIVES

In the United States the term "industrial education" is frequently used to designate everything from the simplest form of bench work in the elementary schools to full-time trade-school work and the work done in training departments of industrial plants. This broad use of the word often leads to considerable confusion, especially since certain types of industrial education are classified as industrial arts, manual arts, or manual training. A decision as to the classification of industrial work should be based upon the nature of the objective set up for training.

The objectives for industrial-education courses are best defined on bases of function. What contribution does the training offered in one of these courses make toward qualifying one to perform any of the life activities which require on some level manual dexterity and knowledge for its performance is the first question that should be asked in determining what courses shall be offered and to whom they shall be offered. During the past two years there has been an increasing tendency to define objectives in terms of ability to perform worth-while activities.

The important objectives for industrial courses which are generally recognized are as follows:

1. To train the hand and eye in the intelligent use of tools and materials through certain fundamental operations which it is well for an individual to be able to perform, regardless of his occupation.
2. To develop an appreciation of constructive work with different types of materials, in order that the individual may be a more intelligent consumer, regardless of his occupation.
3. To gain an insight into and an appreciation of some of the important industrial arts, in order that the pupil may make an intelligent choice of an occupation.
4. To develop ability to perform a variety of practical tasks sufficiently well to meet general social demands and the needs of home life but not necessarily up to the standard of occupational practice.
5. To prepare an individual for profitable and advantageous entrance into employment in a definite industrial occupation, with the status of an advanced apprentice.

6. To provide an opportunity for those who have already entered occupations to add to the knowledge and skill which they already possess, in order that they may become more expert workers, with increased earning capacity and a better chance for promotion.

Some general education values will accompany the realization of any of these specific objectives, but they will be especially pronounced in connection with the objectives suitable for the elementary grades. The first four objectives are or should be those of manual training or manual arts departments in the elementary schools and junior and other high schools. There is considerable evidence to support the statement that the fourth objective is recognized to an increasing degree as one of the most socially worth-while objectives for industrial arts and manual training courses. The last two are specifically vocational objectives and should characterize the work of every school or class that claims to be vocational. The fifth applies to the full-time trade extension evening schools, and in most cases of part-time trade extension classes.

Work which has a vocational aim necessarily has definite and clear-cut objectives, and it is unquestionably true that the clear definition of aims and purposes of vocational schools and classes is reacting upon nonvocational work in shop subjects and tending toward a clearer definition of the aims and purposes of such work. While some progress has been made along this line in the past two years there is still great need for further improvement in the definition and aims in the whole field of industrial arts and manual training. Definite objectives must be set up in terms of abilities to perform some specific life activities in these lines and which will qualify one for normal living experience.

THE ALL-DAY TRADE SCHOOLS

During the past two years there has been a slight increase in the number of of the all-day trade schools and in the enrollment in such schools. During the year ended January 30, 1924, the total enrollment in all-day trade and industrial schools, federally aided, was 33,262. Of this number, 27,012 were boys and men and 6,250 were women and girls. It is generally recognized that the all-day or full-time school is a rather difficult type of school to establish. This is especially true in cities where the high schools are predominantly of the academic type, with the emphasis upon college preparatory courses. In such a situation the tendency is for the children completing the elementary school either to go to the regular academic high school or to leave school and go to work. Regardless of the fact that the great majority of high-school pupils enter employment either before graduation from high school or soon after graduation,

the idea still prevails in many cities that the best type of high-school work to offer is that type which is especially approved by associations of colleges and secondary schools.

Where this situation exists it can not be expected that any great numbers will be attracted to a school the avowed purpose of which is to give training in some specific trade for advantageous entry into employment. When under these conditions an attempt is made to meet the needs of young people of high-school age prior to entrance upon employment there is, in a great majority of cases, more or less of a social stigma attached to those who enroll in the trade school. Because of this and other difficulties surrounding the full-time day trade school on a preemployment basis, there has been a marked tendency to develop trade training on the cooperative plan, whereby boys alternate between work and school every week or every two weeks. While there is considerable evidence that the tendency is toward establishing cooperative part-time and apprentice training, the full-time school, as such, is still an important type of institution which, in many cities throughout the country, is doing an important and valuable work. The tendency toward an increase in part-time and cooperative apprenticeship training under an alternating plan, however, is unmistakable and will undoubtedly increase.

TYPES OF FULL-TIME TRADE SCHOOLS

The existing trade schools may be grouped into three principal classes, as follows: (1) Separate schools as a part of a city system of public schools; (2) departments in high schools; (3) State trade schools.

Under suitable conditions as to organization and administration the separate trade school has a fair chance to succeed. The vocational department in the general high school as a rule has a difficult time in maintaining its work on a strictly vocational basis in the academic atmosphere which usually characterizes the city high school.

In some instances, the attempt to establish vocational departments in high schools has had to be abandoned. However, there are numerous instances where such departments are fairly successful and are doing efficient work. The success or failure of such departments depends, at least in part, upon the attitude of the school officials and the high-school principal and his staff toward it, and varies with different school systems and different types of school organization.

Where State trade schools have been established they have as a rule been remarkably successful. The State of Connecticut is definitely committed to the idea of State trade schools. Without

any reflection upon any city trade schools and vocational departments in high schools, it can fairly be stated that no full-time trade schools anywhere in the country are more efficient than the eight trade schools in the State of Connecticut. Within the past two years definite trade courses have been established at the State School of Science at Wapheton, N. Dak. This school being apart from the academic atmosphere of the city high school is free to set up definite trade courses. In the limited number of trade courses thus far developed the work is eminently successful.

OTHER TYPES OF ORGANIZATION

The State of Wisconsin has enacted laws and adopted policies which make it possible to develop vocational education in that State upon a somewhat different basis than is possible in other States. With its State apprentice law, its industrial commission, and separate boards for industrial education, it is possible to set up vocational schools which are in no way hampered by traditional standards. Probably one of the most efficient schools in the United States is the Milwaukee Vocational School. During the past year this school enrolled for courses in the day school a total of 16,355. The maximum number in attendance at any time in the day school was 11,272. The total number enrolled for classes in the night school was 6,397. It must be borne in mind that this, in the main, is a part-time school. The great majority of the students were in attendance but one day of eight hours per week.

The foregoing school includes the following departments: Apprentice, rehabiliation, "permit," and full-time commercial. Apprentices are required to attend one-half day a week until they have completed 400 hours of schooling. The work, in the main, is related to their shop work. Occasionally some shop work is done in the school. In the permit division the students are required to attend eight hours a week until the end of the quarter following their eighteenth birthday. Approximately half of their time is devoted to academic work, some of which is related to the vocational work. Boys are given opportunity of selecting vocational work preparatory to apprenticeship in about 50 lines.

SCOPE OF THE WORK

A recent publication of the Federal Board for Vocational Education lists 158 distinct titles of courses offered in full-time day and part-time trade extension schools. The great variety of instruction offered indicates that these schools are to an increasing degree meeting the vocational needs of the people. No one is justified in mak-

ing the assertion that the work of trade schools is confined to five or six of the skilled trades. Such a statement would have been true eight years ago but not so now.

EVENING SCHOOLS

The growth of evening trade extension schools and classes has been steady during the past seven years, and during the year 1924 the rate of increase has been somewhat greater than the rate for the previous year. The enrollment in the evening schools receiving Federal aid was, in round numbers, 85,000 for the year 1924, or more than two and one-half times the enrollment in day trade schools.

The eighth annual report of the Federal Board for Vocational Education lists 135 distinct courses as indicating the scope of evening school work. The United States Census report for 1920 lists 11 general groups of occupations. They are: Food and kindred products; Textiles and their products; Iron and steel and their products; Lumber and timber products; Leather and its finished products; Paper and printing; Chemicals; Stone, clay, and glass products; Vehicles for land transportation; Railroad repair shops; and Miscellaneous industrial occupations. Persons from each of these general groups have been enrolled in evening classes. For most of the general groups various numbers of distinct courses have been offered—more than 20 in some instances. The fact that 6,000 coal miners were enrolled in evening trade extension classes in mining subjects during the year 1924 indicates the development of evening school work, and shows the need for organizing specific courses that are of practical value for the occupational improvement of employed persons.

APPRENTICESHIP FOR THE SKILLED TRADES

Apprenticeship for the skilled trades is recognized as constituting a problem that must be solved. During the past two years there has been a notable revival of interest in apprenticeship on the part of employers of labor, manufacturers, architects, engineers, and others whose interests are affected by the shortage of skilled workmen. The revival of interest in apprenticeship is not confined to any one line of work, although it is very pronounced at present in connection with the building trades. Much is being accomplished in the promotion of plans for efficient apprenticeship training, not only in the building trades, but in the various machine and mechanical trades. As modern conditions make it impossible to revive the old system of apprenticeship, it is more and more recognized

that the new apprenticeship, to fit modern conditions, can be most effectively operated through cooperation with the public schools.

Experience indicates that the problem involved in apprenticeship plans can be solved only where there is cooperation on the part of at least three groups, viz, the employers, the workers, and the public schools. Each of these is an interested party to any apprenticeship training program. Each has certain peculiar and inherent interests in any program to be developed, and in addition has certain other cooperative interests common to the other parties. The interests of no one party can be fully developed without the other. This necessitates the setting up of a definite unified objective for an apprenticeship course which will embody the best interests of all parties. In the old apprenticeship days the employer was responsible not only for the trade education but also for whatever general education the apprentice was to receive. The parents as interested parties to the contract aimed to secure both of these benefits to their child. Owing to the changed condition in the industries and to the extension of public education, it is incumbent upon the public schools to assume responsibilities in connection with the training of apprentices.

As this work has developed, organized labor has shown conclusively that it is ready and willing to cooperate to the greatest possible extent in the promotion of effective apprenticeship training. This is not to be wondered at in view of the fact that real labor leaders have always been in favor of the thorough training of apprentices and have always lent their support to programs of vocational education under public control. At this time it is not possible to give definite figures showing the development of apprenticeship plans.

The fact that the State of New Jersey is cooperating in a program of education and training for 2,000 regularly employed apprentices is indicative of the development which is growing throughout the country. Cleveland, Ohio, has more than 12,000 apprentices enrolled in the building trades and this year graduated a class of 150 who completed not only their job training but the courses given in the schools covering the technical aspects of their trades. Bricklaying is one of the trades in which there has been notable success in increasing the number of apprentices through the cooperation of employers and labor. This is evidenced by the fact that in July, 1921, there were 1,427 apprentices and on June 1, 1925, there were 11,602.

While the promotion of apprenticeship is essentially a problem to be worked out locally, a very effective background for local development is created through the cooperation of national and State organizations of employers and workers. During the past two years

school officials and employers and workers' organizations have held a number of joint conferences of a national or State character for the promotion of apprenticeship programs. The Federal Board for Vocational Education has attempted to encourage local initiative in the development of local programs to meet local needs and at the same time has made important contacts with National and State organizations to back up the program. Among the important organizations with which cooperative work has been done are the following: The American Construction Council; the Associated General Contractors of America; the Bricklayers, Masons, and Plasterers' International Union; the Mason Contractors' Association; the National Association of Sheet Metal Contractors; and the National Granite Association. In many cases local development has been promoted because such national organizations have indorsed the program. The Federal Board for Vocational Education has had a number of conferences in which representatives from all the interested groups have participated.

With the growing conviction that education for any particular individual is for the purpose of adjusting that individual to society, there is a manifest tendency to establish fewer part-time schools of the general continuation type and to establish more offering practical courses for training in some phase of the life activities found in the trades and vocations. As a clearer comprehension of the function of part-time education is developed the courses for the employed youth enrolled in these schools are becoming more and more of a vocational nature.

The type of general education as found in the grades and high schools is not adapted to the work of the part-time school, especially for the older boys and girls from 16 to 18 years of age. There is a manifest need for making the work for these older boys and girls more directly related to their vocational needs as determined by their employment. Whether or not the work of the part-time school is looked upon with favor where it has been established depends largely upon the organization and types of courses that have been offered. The more nearly the courses are organized to meet the needs of employment the more favorable is the local attitude toward the part-time work done in the public school.

Probably the greatest development in apprenticeship training has been in connection with the building trades. During the year 1924 there were in Federal-aided classes alone more than 20,000 persons enrolled for apprenticeship and trade-extension courses in the building trades. Five thousand were enrolled as apprentices and students in day trade schools, taking trade preparatory work. Fifteen thousand were employed persons taking trade-extension work.

These figures are indicative of the tendency to establish courses in the part-time schools which more nearly meet the vocational needs of these employed persons. Many of the part-time schools and classes have been of the general continuation type, but as the possibilities of the part-time school as an agency for meeting the practical needs of the apprentice on the job are more fully realized the tendency is to offer courses which are more strictly vocational. Especially is this true for employed students more than 16 years of age. The courses organized for such students should be largely to meet their vocational needs. For this older group the function of the part-time school is to give definite preparation for vocational work and for advancement in employment. The success of the part-time school and the attitude of the local community toward it will be determined largely by the degree to which it realizes these objectives. For the pupils in the part-time school who are under 16 years of age more of the general continuation type of school work can be given successfully.

LEGAL PROVISIONS AFFECTING PART-TIME EDUCATION

Twenty-five States have enacted some form of part-time compulsory education laws. In other States the spending of money for part-time classes and for vocational education purposes has been legalized. The age of required part-time attendance by the laws of the different States varies, but the majority of the States place the lower age limit at 14, two States at 16, and one at 12. The upper age limit for attendance varies from 14 to 18. The hours of required attendance per week vary from four to eight. The number of weeks of required attendance usually approximates the full school year. The minimum number of minors required to establish part-time classes varies in the different States from 12 to 2,000, the majority of States requiring no more than 20.

Not only has there been an increase in the number of States which have enacted part-time compulsory school laws, but there has also been considerable extension of general education requirements. For example, Wyoming, in 1923, raised the age of compulsory education to 17 years. Nevada now requires full-time attendance to the age of 18. New York State has extended its part-time law to include towns between 4,500 and 5,000 population. This extension of the period for compulsory education is significant for industrial education in that many students who had formerly been going into employment are now by the hand of the law retained in school for at least a part of the year. It is the function of industrial education to aid in providing for the needs of this particular group. Three

million children between 14 and 18 years of age are out of school. Three hundred thousand of them are 14-year-old boys and girls, a half million are in the 15-year-old group, and those 16 and 17 years old number more than 2,000,000. In the course of time more and more of the children who are now out of school altogether will be kept in school for a part of the time. It will be the duty of industrial education to help formulate a program for them that will be worth while in helping them to make proper adjustment to social, economic, and industrial life.

It is well known that the percentage of the school population going to high school is increasing. In 1900 only 3.3 per cent of the enrollment in the elementary and high-school grades was in high school; in 1920 the corresponding percentage was 10.2; in 1922 it was 12.3. This increase in high-school enrollment gives an added responsibility for the further development of industrial courses to meet the needs of the increasing numbers whose chief interests are along industrial lines. This principle works both ways. Increased high-school enrollment not only creates an obligation for further development of vocational courses to meet the needs of those whose interests are along industrial lines, but the introduction of vocational courses increases the percentage of enrollment in the secondary schools.

Although only 25 of the States have enacted laws which provide for compulsory part-time school attendance by employed minors between certain age limits, a number of continuation schools have developed in States which have no such laws. Some of these schools are among the best part-time or continuation schools in the country. This leads us to the conclusion that the success attained in the establishment of part-time schools is largely a matter of education of the local community to an appreciation of the value of such schools for meeting the needs of the employed minors.

During the fiscal year ended June 30, 1922, the total enrollment in Federal-aided part-time schools of all types was 228,555. The enrollment for the same schools for June 30, 1924, was 321,138, of whom 256,133 were enrolled in part-time schools of the general continuation type.

It is a debatable question whether the best way of establishing continuation schools for employed minors is first to get a law through the legislature; second, attempt to enforce the law; and, third, educate the public sentiment in favor of part-time education. Experience seems to indicate that a more logical procedure is first to create public sentiment in favor of part-time education by demonstrating its value in specific cases. Following this it is relatively easy to secure the necessary legislation to make it universal through-

out the State. If this procedure is followed, the question of enforcement becomes of minor importance, and it is possible to maintain continuation schools without running into conflict with public opinion.

MANUAL WORK, NOT VOCATIONAL

There is great confusion in the use of terms to designate manual and industrial courses other than those of a strictly vocational character. The terms "manual arts," "mechanic arts," "industrial arts," "mechanical arts," "practical arts," and "manual training," as well as a number of other terms, have been used frequently to mean the same thing and again to mean different things. In order to avoid the confusion resulting from the use of any of these terms, one large city school system is using "manual education" to cover all forms and phases of the work involving manual manipulative processes. Another large city, with an excellent program in this field of education, has issued a very commendable monograph covering all objectives and courses, under the term "industrial education." Included are courses for all manual activities beginning with the fourth grade and continuing through the senior high school. In connection with the descriptions of the courses, the fourth, fifth, and sixth grades are placed under the heading "elementary manual training"; the work for the seventh, eighth, and ninth grades (the junior high-school period) is listed under the title "prevocational industrial education"; and that for the senior high school under "vocational and nonvocational education." Although the term "manual training" is still to be met, it is no longer in general favor.

It is not meant to deal here critically with the use of these terms, but to point out the fact that there is lack of agreement as to nomenclature for designating work of a manual and industrial type, not vocational. It is to be hoped that out of this general confusion such an urgent need for standardized designations for different phases and levels of the manual work will be felt as will lead to some cooperative effort on the part of those responsible for the use of such terms and result in the adoption of a terminology that may meet with general approval and become standardized.

The same general confusion found to exist with reference to terminology is also apparent with reference to subject matter and aims for the different courses offered in the manual arts type of work. There is no general agreement as to the variety of work to be offered or the values to be realized in specific courses for the different grade levels. Some individual systems have given careful consideration to the selection of courses and to specific worth-while objectives, but there has in general been a lack of appreciation of the real need for

careful definition and evaluation of the work to be done. Too often the courses selected and the aims set up are the result of tradition rather than of scientific investigation. Past practices and procedures are still too influential in determining content and aims of instruction. As a result of this situation money for equipment and instruction, as well as the time of the students, has been spent upon some types of work that are of doubtful value. For example, it is the judgment of some whose opinions are to be respected that many schools still place too much emphasis upon woodwork of the old type.

Forces are at work, however, for the correction of these shortcomings in the manual arts type of work in the public schools. The development of the definite objective for vocational industrial education courses as training for entry upon employment in some specific trade is forcing serious consideration of the place and value of manual arts education in our public-school program. Probably the greatest factor contributing toward the solution of the problems dealing with the selection, content, organization, and aims of such courses is the application of the principles of modern scientific curriculum making. Modern ideas of curriculum building, laying stress upon the development of specific abilities through natural forms of experiences, are doing much to change the conception of manual arts work from that of formal exercises of the old manual-training type and with general training objectives to that of practical activities of a project nature qualifying one to perform specific life activities.

Another corrective force exerting its influence for the clarification of subject matter and methods in the manual arts work is the better understanding and application of the psychology of interest and of habit formation. The application of the psychology of interest to the selection of activities for manual work has led to the development of more project work and less of the formal exercise work. In addition, it shows the need of selecting for each grade group projects of a kind and on a level with the pupil's interests. The making of kites, sailboats, bird houses, radio sets, and many other articles to be used in connection with the pupil's leisure-time activities, and the performance of many production and service jobs found in connection with the home and community life are now commonly accepted practices. A better knowledge of the psychology of habit formation is leading to less stress upon transfer values of the manual arts courses and to more emphasis upon the acquisition of definite types of manual experiences and industrial information. The work done in these courses must itself contribute specific values for meeting some normal living experiences.

HOME MECHANICS

As a result of the effort to give training that will develop abilities to meet successively normal living experiences, there has been considerable shifting and changing, both in the content of the courses in the manual arts and in its organization for instruction purposes. At present, the home-mechanics course is in considerable favor, as it organizes the manual work of the school upon a practical basis and affords opportunity for training in a variety of elementary, fundamental processes which qualify one for performing many of the repair and maintenance jobs of the home and community. Some school systems are organizing almost all the work offered above the elementary grades on this basis. This is especially true for the smaller school systems where trade shops can not be maintained on account of their cost. A number of State departments of education are holding regional conferences within their States for the purpose of developing courses in home mechanics. In such conferences emphasis is placed upon the values to be derived from such courses and is given to working out local programs with suitable content material. Special emphasis is placed upon the selection of projects that are of practical value in ordinary home life and which will appeal to the interest of the pupils, and whose learning difficulties are on a level comparable with the pupils' accomplishments.

THE GENERAL SHOP

The general shop as an organization for instruction is in considerable favor, especially for the junior high-school period, where all the activities are given in connection with one-shop organization under the direction of one teacher. Some of the advantages which may be derived from such a general shop organization are:

1. It brings together, in one-shop organization, activities dealing with a variety of materials and processes. It makes possible the completion in one shop of a project which is of special interest to the student. This is of value in that one teacher, interested in the boy's work, can direct his activities for all the work done on the project.

2. It makes possible the acquisition of a large amount of indirect experience covering a variety of activities and processes. Work organized on the one-shop basis affords opportunity for observation of the work of other students on various activities far beyond that which would be possible in a one-activity shop. Such experiences extend very considerably the trade and industrial knowledge of the boy.

3. The shop training and experience resulting from performing operations upon a variety of materials and the use of a variety of

tools qualify the pupils to do various jobs connected with home and community life. Many of these can be used as projects in the general shop and are valuable in that they represent activities found in normal living experiences.

4. The work of the general shop may serve as preparatory work for young pupils who will later enter upon trade courses.

5. Through the possibilities offered for the discovery of aptitudes and interests the work of the general shop serves in the realization of the "trade-finding" objective of the manual arts work.

It is the opinion of some who have made a thorough study of the work of the general shop, particularly as found in the junior high school, that it is destined to play an important part in manual arts activities in the schools. This is especially true for schools which are limited in number of pupils and in rooms and equipment. Some of the unsolved problems are: Properly qualified teachers, proper methods for handling and distributing materials and tools, and proper methods for organizing instruction materials and the use of proper teaching methods.

Sometimes the general shop is organized on the basis of a cycle of shops, the pupils rotating through a number of one-activity shops for a given period in each. Here, also, the pupils are offered a variety of experiences, but which are more specialized along specific trade lines. This scheme is of particular value in senior high schools where the work is so arranged as to be of value for preparatory and trade-finding purposes.

As an example of this type of general shop organization the scheme followed in a large well-organized senior high school may be cited. In this particular school the general-shop boys are given during their freshman year a six-week period in each of six shops: Plumbing, printing, auto repair, machine shop, electrical work, and woodworking. In each shop the boy is given as definitely as possible an intimate contact with the work of the trade. Advantage is taken of various opportunities to get to the boys information about the trade or industry which can not well be given in the shop or classroom by ordinary methods. Motion-picture films are used regularly. At the close of the six-week period each group is taken on a shop trip to a plant which is typical of the work just finished in the shop. At the end of each shop course the boy is interviewed by his instructor and given an opportunity to express himself freely in regard to his experiences.

The time given to the manual arts type of work and the variety of courses offered, as revealed by an examination of the courses of study of a large number of school systems, is convincing evidence of the value of such work as a part of a program of studies for the accom-

plishment of the objectives of the school. Forward-looking steps will be in the direction of the further refinement of aims and content in school courses to meet more definitely some of the specific objectives embodied in the public school program.

PRIVATE AND CORPORATION SCHOOLS

Following the signing of the armistice there was a marked decrease in the program of training in industry which had been built up during the war. A great majority of the vestibule schools disappeared because they were no longer necessary. Although there was no great shortage of ordinary factory workers, there was and still is a shortage of highly skilled workers. Naturally, the best types of corporation apprentice schools were not eliminated at the time of the readjustment, but, on the other hand, these schools have grown and developed to a point in advance of anything heretofore found in the field of privately supported vocational schools. Large corporations can afford to run their own vocational schools in the same way that they can afford to maintain their own fire departments. The majority of individual plants, however, are not large enough to support regular apprentice schools such as many of the railroads maintain and such as are found in the large mechanical and electrical manufacturing plants. There is, therefore, a considerable need for agencies other than private corporation or apprentice schools to provide equally efficient training for those who will find employment with similar organizations. The full-time trade school and the part-time cooperative apprentice school are meeting this need in part. The work of such schools is supplemented by correspondence schools and private and semipublic schools.

The entire matter of vocational training is in process of adjustment and unquestionably will be carried on in the future in such ways as are most efficient and result in the lowest net cost to society. To an increasing degree, it is recognized that training costs money. An employer can not evade this cost by looking to some one else to train his men for him. If the teaching is provided by public schools, he will have to pay his share by means of taxes levied to support such schools. If he trains his own men, he will pay for the service more directly. If he attempts to get along without training any men, and discourages publicly supported vocational education, he will eventually have to put up with a supply of incompetent or half-competent workers. Their inefficiency on the job and lack of skill will probably, in the end, cost him more than would participation in an organized training scheme. If he is to continue in business, he can not get along permanently with semi-

skilled and unskilled workers; consequently he will have to face the fact that semiskilled and unskilled persons will have to acquire training for the job while in his employ. From the present situation in industrial training, it appears that for many occupations certain phases of training can be given more efficiently and at less cost on the job than in any form of school. On the other hand, there are types of training which can probably be given better at less cost, and with greater social values in public schools. However, there are innumerable cases where the most efficient and less expensive plan involves some type of cooperation between industry and the public schools. Notwithstanding the fact that examples of such cooperation are increasing at a remarkably high rate, a beginning has hardly been made in solving the problem.

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