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BIENNIAL SURVEY OF EDUCATION IN THE UNITED STATES 1928–1930

CHAPTER IV

INDUSTRIAL EDUCATION

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CHAPTER IV

INDUSTRIAL EDUCATION

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PROGRESS IN INDUSTRIAL EDUCATION

Progress in industrial education during the past biennium was marked by a large increase in the number of different occupations included in the programs of training, by an increased total enrollment in industrial courses, and, in most instances, in each of the different types of industrial schools and classes, by increased expenditures, by an increase in the number of schools offering industrial courses, by improved housing facilities, by inclusion in training programs of more occupations of a highly specialized and semiskilled type, by the further development of local cooperative and advisory committees for specific trades to assist local schools in the organization of courses, and by a more critical attitude toward plans for the training of industrial teachers.

A number of factors have operated to bring about an increased spread of industrial training to include a greater number of occupations. Among these are:

(1) The recognition of responsibility on the part of public schools for providing training that will have value for employment in highly specialized and semiskilled jobs, for example, manicuring, pressing and dyeing, and certain machine operations. In the early development of industrial training the trades included were limited to those of a character that necessitated comparatively long periods of training, the mastery of numerous highly skilled operations and a comparatively large amount of technical knowledge. Outstanding examples of this are the general machine-shop course and the general course offered in electricity. The past two years have witnessed a growing inclination on the part of local systems not to limit, as pre-

viously, training opportunities to a few comprehensive types of trades but to equalize more nearly provisions for industrial education by including some occupational courses for which training can be effectively given in a comparatively short time and in which large numbers will find employment.

(2) The recognition of the continued specialization in industrial work resulting in more types of jobs, many of which require only a limited variety of skills for their performance.

(3) Increased technological unemployment resulting in a demand for training that will qualify for employment in new types of jobs developing in industry.

(4) The need for short-unit courses of a trade-extension type in various trades for the purpose of upgrading workers in their jobs or for their promotion in the trade field in which they are employed.

(5) An increased knowledge of the types of occupations for which it is feasible and advisable to attempt training under public-school supervision and control. The rapidly accumulating information on this subject is coming largely from three sources: (*a*) Definitely planned studies for the occupational analysis of various trade and industrial fields, usually made by local school officials or National or State agencies in cooperation with such officials. A considerable number of such studies have recently been made. At the present time the State Department of Education of Pennsylvania is planning to carry on studies in a number of occupations heretofore not commonly included in programs of training, for the purpose of determining the feasibility of training, the content of the specific course, the length of training, and efficient methods of instruction. It is intended to make, first, a preliminary study of each occupation in cooperation with representatives of employees and employers for the purpose of developing a tentative program of training and then to try out the program experimentally with a small training group, thus refining and standardizing it for general use. One of the studies to be included is a janitorial course to be tried out with a selected group of school janitors. (*b*) Reports of advisory committees from industry working with the local schools in the development of their industrial programs. For example, in Wisconsin there are in many cities advisory committees working with State and local boards of vocational education for the development of trade courses of an efficient type to meet the needs of the industries. (*c*) Plant foremanship conferences conducted as a part of the local industrial-education program. Information developed in these discussion groups frequently results in valuable suggestions as to occupations for which training is needed.

Reports on the growth of industrial programs for the country as a whole show a substantial increase in both enrollments and number of classes maintained; reports from different sections of the country, however, vary to some extent with respect to these items. The increase in enrollments in day industrial classes was at a normal rate. In most places evening work showed a comparatively large increase. Available information on part-time cooperative classes indicates an increase in their rate of growth. The growth in general continuation classes was comparatively limited. This is a natural result of the labor situation, which makes it difficult for young persons to obtain part-time employment. Significant statements taken from reports of a few States will give some indications as to the situation in industrial education.

A report from Massachusetts states that the day vocational schools continue to increase both with respect to enrollments and number of courses offered. The total enrollment for 1929–30 increased 15.9 per cent in the day schools. The number of graduates for the same year represents an increase of 14.3 per cent over the previous year. A considerable number of schools in this State can not accommodate all the day students who wish to attend. Waiting lists have been established in most schools. For example, the Worcester Boys' Trade School has a waiting list of approximately 300, the Springfield Trade School has a list of 200. The report further says that if additional accommodations could be provided the enrollment in day schools would increase rapidly. The attendance in evening industrial schools reflected somewhat the industrial conditions. In some centers attendance was very poor; in the majority, the attendance was very good.

A report from Iowa states that the year 1929–30 was, in several respects, the most successful that the State has had in trade and industrial education. One hundred and ninety classes in trade and industrial subjects were in operation with an enrollment of 4,100. Evening classes were organized in 22 cities. In some, classes were held in industrial plants. In spite of the fact that building operations were below normal there was a healthy growth in vocational trade and industrial evening schools in the State. The enrollment in evening courses represents an attempt on the part of the workers to prepare themselves for advancement.

Oregon reports increased enrollment in all trade and industrial classes, particularly in the evening classes. The evening classes enrolled 1,240 against 546 enrolled in part-time courses and 187 in day classes. Rhode Island reports building up strong evening classes in short-unit courses, growth of apprenticeship work, and the improvement of the teacher-training program.

In Ohio material progress in all kinds of industrial classes was made for the year ending June, 1930. The increase in enrollments in trade and industrial courses amounted to 17 per cent for the year. A total of 23,680 persons was enrolled in industrial classes and a grand total of almost $800,000 was spent on all types of industrial training. Training of employees in industry was an outstanding part of the Ohio program. These reports indicate the tendency toward short specific types of courses for training individuals for employment.

Another type of course which showed quite a large growth during the past two years is the foremanship course, offered for the purpose of up-grading plant foremen in the duties and responsibilities of their jobs. In Wisconsin this type of course received special attention. Itinerant instructors in foremanship training were employed for different sections of the State and conducted classes in different cities. Their work was organized in circuits of cities, five cities to a circuit. Each itinerant instructor held classes in one circuit spending one day a week in the five cities of the circuit. At the end of 13 weeks or the completion of the course he moved into another circuit of five cities, and so on throughout the year. In the summer time these persons worked in conjunction with the teacher-training staff of the State board of vocational education for the purpose of conducting classes for the training of foreman leaders. In Wisconsin a number of cities employed a joint coordinator to study the need of adult workers for continued training and to assist local boards and State boards in working out a program to meet their needs. In New Jersey the work of foreman training also showed a healthy growth. The interest of industrial executives is shifting to some extent, according to a report from the State department of education, from the problem of men and machines to human relations. In connection with the foreman training a series of conferences were held for industrial executives, conducted by a psychiatrist employed by the vocational division of the State department of education, dealing with problems of mental hygiene. The effect of these conferences upon the morale of various workers was noticeable. New Jersey has been outstanding in the progress it has made in developing new types of courses to meet new needs in industrial work. During the past year the Girls' Vocational and Continuation School at Newark organized a course of training for girls who wish to become dental assistants. A new building to house this school was recently erected at a cost of $1,000,000. It was built to accommodate approximately 1,000 pupils.

In New Jersey increased attention was given to the layout of shops and selection of equipment. It is now a well-established practice, though not a requirement, for architects when designing a new building to consult the State department of education before proceeding

with the design and location of shops. The State department is also able to influence architects and boards of education as to the amount of space as well as the location needed for industrial shops. This cooperative relation has developed rapidly during the past two years.

Pennsylvania reports a large and varied program in industrial courses. This State has an especially large program in part-time cooperative work on a 2-week basis. Industrial-arts work for the junior high school grades is the usual practice. The number of schools having the general shop organization is increasing. Plans are in process for raising the educational qualifications of industrial-arts teachers. Connecticut reports a large increase in the number of students taking machine courses and a decrease in the number taking carpentry and building courses. There was a large increase in part-time trade-extension classes in that State. Delaware conducted trade and industrial courses in part-time and evening classes only. According to a report from the department of education this State is confronted with the problem of providing retraining for persons who have been thrown out of employment because of industrial changes. In Maryland substantial progress was made in extending the vocational-industrial program in the city of Baltimore. Industrial-arts work was extended in the smaller communities and the programs improved. There was a strong increase in the tendency to organize the general shop in the smaller schools. Texas reports the greatest advance in recent years in industrial education. Foremanship work was greatly expanded. There was a considerable increase in the number of schools meeting the requirements of the State department for industrial-arts courses. Illinois reports no noticeable changes in the industrial-education program except the improvement of teaching.

There is some variation in the development in continuation-school work. Some places report large increases, others decreases, in the continuation programs. The State of Utah uses its funds for vocational education largely in developing general continuation programs. That State is making a special effort to include in its education program all of its school population. Recently an attempt was made to account for all boys and girls from 6 to 18 years old during every month of the year. The older group, who are permitted to enter employment, must either be employed or in attendance at school. For the year ending June, 1930, approximately 95 per cent of the total school population were accounted for in terms of this program. Inasmuch as there is considerable seasonal employment in Utah, the demand for dull-season instruction through part-time continuation classes was large and made it necessary to provide considerable funds for coordination and instruction.

Michigan reports a growing apprenticeship program in spite of the unemployment situation. In 1929–30 the apprentice classes in Detroit enrolled 759, of whom 182 were on a part-time cooperative basis. Numerous other cities in the State conducted apprenticeship courses. In most places apprentices attend school four hours each week, carrying work in related subjects. At Detroit the new Wilbur Wright Cooperative High School was erected. In Texas the general part-time program was greatly enlarged by its adoption in a large number of cities and the inclusion of more subjects of instruction. Information from Oregon shows that the cooperative type of training is more satisfactory than any other, due largely to the small size of school communities which would make shop work in the schools expensive. Portland has developed an apprentice school. This State reports a need for providing training for waitresses, cleaners and dyers, and laundry workers.

In Wisconsin part-time schools are officially classed as vocational schools. The part-time schools are under the joint administration of the State board of vocational education and the local board of vocational education. Enrollments in these schools are large. The part-time vocational school in Milwaukee is one of the largest vocational schools in the United States. Excellent apprenticeship training is carried on at this school. A study of the apprentices is under way which will yield valuable information as to the character of this type of pupil and which will be helpful in the organization of apprenticeship courses.

In Iowa the enrollment in part-time general continuation classes was smaller than usual, indicating that the full-time schools in this agricultural State are holding the majority of pupils up to the age of 16. The schools in Iowa are also returning many of their part-time pupils to the full-time day classes for the reason that these pupils are now in competition with an ever-increasing supply of high-school graduates. The child labor laws are acting as a deterrent to the employment of young persons of school age. Connecticut reports a large increase in part-time trade extension classes.

Massachusetts reports an increase in part-time school enrollment. The part-time work is organized under favorable conditions; in some places the shop work is given in the factory under plant foremen, and the supplementary instruction is offered in the trade school. Virginia reports an interesting and successful piece of work in connection with the ship-building industry at Newport News. During 1929–30 instruction was given to 176 apprentices, six hours per week, in mathematics, physics, English, and economics. In addition to this number 1,228 workers in the shipyards in 19 trades received instruction. Twenty-five full-time instructors were employed in the shipyards at a total cost of $61,714.98.

During the past year there were enrolled in the continuation schools in 108 school districts of Pennsylvania 46,018 pupils. A report on a follow-up study of part-time cooperative pupils states that 80 per cent of these continued in the same line of employment after the completion of the part-time cooperative course. A report from the State department of education says that the earnings of boys and girls between the ages of 14 and 16 who are required to attend continuation school averaged, when employed, $8.56 per week, and that during the year 1929–30 the continuation-school pupils of the State earned over $11,000,000. A report from New York State shows that the earnings of this class of pupils amounted to $48,000,000.

During the biennium California enacted a new continuation school law, which permits schools to make a better adaptation of the continuation-school program to meet local needs. It specifically adopts the term "continuation education" to designate the education provided for employed minors; it provides a proposal for a program of guidance, placement, and follow-up for all minors in each high-school district; it designates the time between 8 a. m. and 5 p. m. as the hours of continuation classes; it grants authority to the State department of education to prescribe standards and regulations relative to administration, instruction, and reimbursement for continuation classes; it permits instruction to be offered at the place of employment only when given by a duly certified instructor; and it requires that unemployed minors attend school three hours per day during the period of unemployment.

THE EFFECT OF UNEMPLOYMENT

The question of the effect of the unemployment situation on school programs has been raised frequently during the past two years. School administrators are especially interested in two phases of the question: One the effect which unemployment has on school enrollments, the other the effect it has on the types of classes and courses for which demand may be made for inclusion in the public-school program of training. While there has been no comprehensive study undertaken of these problems, some general information bearing upon the question of the effect of unemployment on education programs is available. Data and other forms of information collected from various sources seem to warrant the following implications:

1. Unemployment is a factor in increasing enrollment in full-time classes in the upper school years. This is largely due to two reasons: (*a*) To the legal regulations in many States which provide that youth between certain ages must be in school all day if not employed. In times when labor is in demand many pupils take

advantage of the provision frequently found in part-time laws permitting them to secure employment on a part-time basis and to attend school for only a limited number of hours per week. With a large amount of unemployment existing the tendency in industry is to replace the untrained part-time group with experienced individuals who can work on a full-time schedule when desired. When pupils coming within the prescribed age limits of the law are dropped from employment they are required to attend school full time. There is, therefore, a shift from enrollment in part-time to enrollment in the full-time classes. This situation does not affect the girls as much as it does the boys, because in some States girls are technically employed when working at home for their mothers. (*b*) To voluntary attendance upon full-time classes by youth beyond compulsory school attendance age, but who find it difficult to obtain or retain positions on account of the unemployment situation.

The enrollment in all-day classes receiving Federal aid under the national vocational law increased 0.22 per cent during the year 1929. The increase for the year 1930 was 13.7 per cent. The Office of Education has compiled, for a few cities, enrollments in full-time vocational schools. The data show that for the 2-year period, 1928–1930, enrollments in full-time vocational schools increased in New York City, Philadelphia, Baltimore, Pittsburgh, Cincinnati, and Portland, but decreased in Minneapolis.

2. Available statistics indicate that enrollment in the vocational evening schools in many localities is increasing. Unemployment is bringing about strong competition for jobs. Workers realize that, in general, jobs go to those who are best qualified, hence they attempt to increase their qualifications by attendance on vocational evening classes. Derived percentages from enrollments in evening classes receiving Federal aid under the national vocational act show an increase of 9.6 per cent for the year 1929, and an increase of 16.0 per cent for 1930.

Reports to the Office of Education show that for the 2-year period ending June, 1930, the increase or decrease in total enrollment for all types of evening classes varied greatly with different cities. For example, the total evening enrollments decreased by 19 per cent in New York City; decreased 6 per cent in Chicago; decreased 30 per cent in Philadelphia; increased 110 per cent in Detroit; decreased 18 per cent in Cleveland; increased 6 per cent in Baltimore; increased 16 per cent in Pittsburgh; increased 107 per cent in Cincinnati; decreased 1 per cent in Minneapolis; decreased 8 per cent in Denver; and decreased 33 per cent in Portland.

Unemployment is tending to decrease the total enrollment in part-time types of classes, especially the general continuation type. Reports from different cities, however, vary with respect to this state-

ment. For the United States as a whole the total enrollment in all kinds of part-time classes which were federally aided under the national vocational act increased approximately 4 per cent for each of the years 1927 and 1928, the average increase for the years 1929 and 1930 was under 3 per cent.

Reports received by the Office of Education show that enrollments in part-time and continuation schools for the year 1930, as compared with the year 1928, decreased 6 per cent in New York City; decreased 19 per cent in Chicago; increased 3.4 per cent in Philadelphia; decreased 56 per cent in Pittsburgh; and increased 49 per cent in Denver. The large increase in Denver was principally due to augmented enrollments in the opportunity school. The part-time classes in this school are composed mainly of adults.

4. A small amount of data has been compiled by the Office of Education on the question of the increase in enrollments in the upper years of the public schools. For a few States for which statistics have been compiled the indications are that the percentage of the entire school enrollment found in the upper grades is greater than it was two years ago. A factor in this situation is probably the effect of unemployment. The older pupils, who do not obtain jobs readily in industry, remain in school for a longer period of time. Data furnished the Office of Education show that for the school year ending June, 1930, as compared with the school year ending June, 1928, the percentage of the entire school enrollment of California enrolled in the tenth, eleventh, and twelfth grades increased for each grade; this percentage for both New Jersey and Wisconsin increased for each grade from the seventh to the twelfth, inclusive. In Michigan this percentage was slightly improved for the ninth, tenth, and eleventh grades.

5. Technological unemployment is also affecting the educational program. Men thrown out of employment owing to changes in manufacturing processes or to the development of labor-saving machinery are seeking retraining in new lines of work. Technological unemployment is therefore putting a demand upon public vocational schools to provide retraining for new kinds of jobs. Changes in production methods and trade work have resulted in some instances in schools having money tied up in "frozen equipment," which, though standard for training in processes formerly in use, is worthless for training in new types of work and production processes necessary to meet the needs of the technologically unemployed. In such situations, schools—if they are to carry on the work of training men to fit into modern industrial life—are faced with the necessity of scrapping their obsolete equipment and investing money in new.

6. Unemployment is directing the attention of administrative and supervisory officials of vocational-industrial schools to the need for specific types of training for specific jobs. Unemployed men are seeking the most direct means of training and the most efficient types of training for the purpose of obtaining a specific pay-roll job as soon as possible. There are indications that a greater effort than formerly is made to provide short and specific types of courses to meet definite needs in industry.

7. Unemployment is resulting in the selection of new teachers with higher qualifications than were formerly obtainable. This is a case of competition, the better qualified obtaining the positions. During the strong labor market of a few years ago it was rare to find a highly skilled tradesman offering his services to teach his trade in the public schools. Occasionally a tradesman would voluntarily offer to teach a course in the evening school as a means of supplementing his day's wages in the industry, but in general the salaries paid industrial teachers were not sufficient to induce an experienced man to give up his job in industry. The unemployment situation is tending to reverse the situation.

PLANS OF ADMINISTRATIVE ORGANIZATION

During the past two years the question of the comparative efficiency of different administrative plans for providing industrial education received considerable attention by leaders in this phase of education. The question became of rather general interest throughout the United States on account of several important factors involved. Among these are:

1. *The factor of economy.*—The fact that there are various plans in existence for providing industrial training, for which public education has responsibility, has invited consideration of comparative costs. It is generally recognized, for example, that the cost of printing instruction as a vocational subject in numerous local small schools is greater per pupil than when centralized in one or a few schools in a State. If a vocational course is offered in numerous schools, especially in the smaller places, it results not only in a high training cost but frequently in the training of too many or too few persons in the particular trade to meet State needs, both of which represent inefficient and uneconomical practices. State and county systems of administration, together with part-time apprenticeship classes of a cooperative type, with much of the expense of training borne by the industry, especially for training equipment, represent effective means for meeting the problem.

2. *The factor of efficiency.*—Efficiency in industrial programs demands that training shall be given only to selected groups for whom

training is feasible and profitable from a vocational standpoint. It also requires adequate and proper equipment for instructional purposes and that the teachers be experienced and trained for the specific services they are to render. In situations where the local school systems encounter difficulty in meeting any of these conditions, especially in day classes, a larger administrative unit for enrollment of students and for school revenue makes for efficiency. A larger administrative unit is an effective way for obtaining a selected group of trainees and for limiting extra costs due to duplication of programs. In communities having a dominant industry efficient training by means of a cooperative plan is usually highly efficient.

3. *The factor of service.*—No plan for industrial training is adequate unless it is made to serve a sufficiently large number of people to meet the needs of industry. No one of a number of small contiguous school districts may be able to provide industrial training, yet the aggregate number of pupils that could be brought together at one place may be ample to warrant the organization of industrial courses. In such an instance the pupils are deprived of their right to vocational courses because the administrative plan of organization is restricted to too small a unit. With good transportation facilities a county or district plan would make it possible to provide industrial training.

4. *The factor of administrative control.*—The question as to where rests the responsibility for vocational-industrial education has been raised in different parts of the country. Present practice varies in different sections of the country. In most instances the local school system assumes full responsibility for providing industrial training, subject to supervisory control by the State if receiving State aid or Federal aid, which comes through the State department. Sometimes the county is made the administrative unit, all vocational work in the county coming under a county system. A State or a district is sometimes made the unit for vocational education.

Interest in the study of various administrative units for providing an adequate and efficient system of industrial education has directed attention to some rather distinct plans found in present practice. Some of these have particular value for the type of communities in which they are located. For example, in North Dakota, which is primarily an agricultural State with a sparse population, a rather unique plan has been developed for providing industrial training. The largest city has a population of about 35,000 inhabitants and there are only four or five cities having a population of 10,000 and 20,000. Because of these facts it was deemed advisable some years ago to centralize the trade-industrial training in one institution, namely, the State School of Science at Wahpeton. The

centralization of the industrial work in one school makes for economy of State funds, provides an opportunity for instruction in a variety of trades that could not be included in the programs of local schools, and insures a school atmosphere that could not be obtained in trade courses offered as a part of regular high-school programs. Instruction in this school is practically free of charge, the total fees paid by the students averaging less than $5 per month for each month they are in school. All students pay their own transportation to and from the school, and the cost of room and board. The school dormitory is operated on a nonprofit basis. The charges for board and room are $23 per month. Instruction is offered in electricity, radio, auto mechanics, auto electrical work, plumbing, aviation, printing, bricklaying, linotype, machine shop, welding, drafting, and estimating.

Any citizen of the State 16 years of age or older who, it is deemed, can profit by instruction is admitted. Each out-of-town student is given individual attention by a member of the staff at the time of reporting for enrollment. Personal help is given students, not accommodated in the dormitory, in locating desirable room and board. Any person is eligible to any one of the trade departments regardless of the grade completed in the public schools. Under this State-maintained school the variety of courses in trade work which are offered could not possibly be maintained by any city of the State. The objectives and plans of the work carried on by this school are indicative of what may be done in sparsely settled States where it is difficult for local schools to maintain trade courses. The plan of North Dakota for providing industrial education has received the highest commendation of some of the national leaders in this phase of public-school education, as an administrative organization for an agricultural State. Even in some States where there are both large cities and small communities in agricultural sections, the plan of supplementing local programs with a State school is under consideration.

In New Jersey the vocational school act provides that a county may establish a county vocational school under the direction of the county board for vocational education. In alloting Federal funds, however, these schools are on the same basis as city vocational schools. The State law, therefore, does not discriminate against cities in this respect. Cities may, if they wish, pay the cost of the transportation of the pupils to a county vocational school. They are not obliged to do so, however. If they do pay such transportation the cities are reimbursed from State funds to the amount of 75 per cent of the cost.

In the counties of the first class the board of education for the vocational school is appointed by the executive officer of the county.

governing board who is known as the director of the board of chosen freeholders. The freeholders correspond to the county commissioner in some of the Western States. In counties of the second and third class the board of education is appointed by the judge of the court of common pleas. No separate State or county tax for vocational education can be levied. The county appropriation for vocational education is raised as a part of the county budget in the same manner and at the same time that other county funds are raised. The State funds for vocational education are set aside on order of the commissioner of education from State school funds that would otherwise be used for purposes of general education.

The New Jersey plan for county vocational schools under the administration of a county board for vocational education has made possible the establishment of a number of high-grade trade schools in the great industrial section of that State. The Essex County Boys' Vocational School, the Essex County Girls' Vocational and Continuation School, the Middlesex County Vocational School, and the Camden County Vocational School represent highly efficient programs operated on a county basis.

In Connecticut the State board of education operates State trade schools by districts established by State authority. The State schools receive the Federal aid allotted to the State. At the present time 11 districts have been formed with a State trade school in each district. Care is exercised in the formation of districts in order to distribute them to meet best the needs for training in different sections of the State. Pupils in cities having no State trade school can easily commute to a city where there is such a school. Until recently State money was used to reimburse towns having no State school for the transportation of pupils to a State trade school located in some other city. The legal provisions for this were questioned and the practice discontinued, but a new bill provides definitely for this item.

Variation in the local, county, district, and State plans is found in several States. In Wisconsin there are local boards for vocational education, consisting of five members, two representatives of local employers, two representatives of local employees, and the superintendent of schools. The members of this board are appointed by the local school board which administers the full-time schools. The boards administer through a director and independently of the local school system, the vocational schools which provide part-time and evening courses. The local boards for vocational education have a separate power for raising money by taxation and receive State and Federal aid. It is to be noted, however, that these schools are provided to take care of a different class of pupils than is found in the regular day schools. In fact schools operated under the local boards for vocational education do not include classes for full-time pupils.

Full-time day courses are a responsibility of the regular schools. In Milwaukee, for example, there are found good full-time programs in vocational education in the city system of day schools and good part-time and evening programs in the vocational school under the control of the local board for vocational education.

In a few States a larger unit than the local system is set up for providing training for special purposes. In Wisconsin, for example, an itinerant teacher is employed jointly by several neighboring cities for the purpose of giving instruction in industrial work on a part-time basis. This plan makes it possible for small schools to provide some efficient vocational training in a limited number of fundamental trades. In Ohio each of the State districts for teacher-training work has a State coordinator who devotes his time to the organization and operation of vocational training for apprentices in company plants. This work is carried on in the small places and is continued until such time as the local schools can take it over.

INDUSTRIAL WORK IN SMALL SCHOOLS

Industrial courses for the purpose of providing occupational training were first organized in the larger cities. The extension of privilege in this kind of education to the smaller school systems has been slow as industrial education, especially of the vocational type, does not lend itself readily to the administrative and instructional organization of the small school systems. However, the needs for industrial courses in the smaller schools are similar to those in the larger schools, but the problems encountered in any attempt to provide instruction for meeting these needs are usually quite different, or if similar, much intensified. Plans for the organization of the work and methods of instruction which are feasible and efficient for the larger schools are seldom so for the smaller schools.

There are usually three outstanding differences between the larger and smaller schools which must be taken into consideration in planning for industrial courses. These differences are to be found in (1) school enrollments, (2) size of teaching staff, and (3) the amount of money available for instruction and equipment. The smaller schools with their limited enrollments can not possibly maintain classes in as large a variety and number of subjects as can the larger schools, for the simple reason that there are not enough pupils to form classes of practicable size. Then, too, the limited number of teachers in the smaller school precludes the possibility of including instruction in but a limited number of subjects, especially by qualified teachers. Smaller schools are also without adequate funds for providing shop rooms and equipment on a scale that can be maintained in the larger schools.

Among the plans which have been found to have merit in attempts to provide industrial education in small places are:

(1) *Apprenticeship courses.*—In a small community which has one or two dominant industries each with enough apprentices to form a class, courses can be organized in related subjects and sometimes in courses for developing manipulative skills, especially if a well-qualified tradesman from the industry can be secured as a teacher. With such a teacher and proper arrangements with the industrial company relative to hours of instruction, attendance of apprentices, and opportunities for coordinating instruction with shop work, the chances for doing an efficient job of training are very high. When all the apprentices are from the same plant instruction is sometimes given in the plant in which the apprentices are employed. There are certain advantages accruing from carrying on instruction in a commercial plant, such as adequate equipment to meet the needs for specific instruction in problems which confront the apprentice in his work, a commercial shop atmosphere, and the saving of the time that would be required for apprentices to make the trip from the plant to the school.

In apprenticeship courses one cardinal principle of industrial training is complied with, namely, that the trainees are a selected group capable of profiting by instruction. Each pupil has already been selected by industry as a person capable of learning the occupational work into which he has been admitted and has evinced an interest in training by entering upon an apprenticeship in the particular trade. Moreover, the employer's cooperation is assured for making the training a success, as he has an investment in the apprentice on which he wishes to capitalize.

In each of the three districts in Ohio into which the State board for vocational education has divided the State for teacher-training purposes there has been appointed an apprenticeship coordinator whose duty it is to organize apprenticeship programs in industry. The apprenticeship coordinator travels to centers where a vocational school could not be established because of the smallness of the community and the cost it would entail. He, therefore, helps the local industries to organize their own training courses for apprentices. Both technical-related subjects and manipulative work in the plant are included. All the training is given in the plants of the companies served by the district coordinator. The services of this coordinator are rendered without cost to the industry until the program is well developed and an employee of the plant is trained to carry on the work. When this is accomplished the State cooperates with the local school system in providing the salary of the plant instructor and of supervising the training as a public-school project. Although

this new program is only two years old, results indicate that it will be very effective in developing industrial training in small communities.

(2) *Part-time cooperative classes.*—These classes are often organized to give successfully instruction to meet the needs of pupils who are privileged under the compulsory school attendance law to enter upon employment on condition that they attend school on a limited part-time basis. Where there are enough pupils working in the same plant to warrant organizing them in a separate class, instruction pertaining to this particular line of work can be provided. Sometimes arrangements are made for organizing instruction on a half-time basis whereby two groups alternate by some definite period—usually one or two weeks—between employment and the school. The success of this plan depends largely upon having a qualified and efficient coordinator to see that the school work is properly related to the work the boy is doing in employment and to make necessary adjustments with the employer for the boy's success on the job.

In a number of places in Wisconsin too small to provide training for apprentices and part-time cooperative pupils four neighboring towns employ jointly an itinerant instructor who regularly spends one day a week in each place. During the day the itinerant teacher gives instruction to apprentices and part-time pupils; in the evening he teaches trade-extension work to classes of adults from the industries. The itinerant instructor also makes and maintains contacts with the local industries for the purpose of determining their needs for training, the feasibility of the public schools cooperating with the industries in providing efficient training, and for securing the help of industry in the organization of a school-training program. To this end the itinerant teacher participates in numerous conferences with local school directors, employer and employee groups, and with local advisory committees composed of representatives of both employees and employers.

(3) *General industrial classes.*—Where it is not possible owing to the small size of the community to organize specific trade courses, it is sometimes possible to organize instruction in one course for a few closely related trades; for example, the mortar trades, including concrete work, bricklaying, and plastering. Another example is building construction, including general carpentry, house painting, and probably some sheet-metal work. Sometimes other units may be included, as house wiring or plumbing. Such a general building construction course should include general repair and upkeep of wooden structures.

The narrow range of jobs included in an occupation at which a tradesman may earn his living in a large city may not be sufficient

for an occupation at which one may earn a living in a small town or rural community. For example, in a city where occupational employment is highly specialized, stair building, interior finishing, house painting, sheet-metal work in building construction, plumbing, and steam fitting constitute trades, but in the small community the general carpenter may perform almost any woodworking job, including wood finishing and stair building, and the plumber may do the sheet-metal work on a house. In Iowa, for example, six cities in 1929-30 conducted general industrial courses centering around work in a typical industry and not limited to single trades. The instruction given included a broader range of skills and technical knowledge than is offered in a specialized trade in a large city. The courses are two years in length and one-half of the time is spent in trade training.

(4) *Training in industrial-arts departments.*—Sometimes an industrial-arts department provides a limited amount of training for a few pupils, which has value for employment purposes. The success of this plan is conditioned by several factors. The teacher must be qualified by adequate experience in a trade to offer vocational instruction, the opportunity must be provided for giving individual instruction to the limited number of pupils in a class who are taking shop work for vocational purposes, and arrangements must be made for pupils to spend the necessary number of hours in shop work to make vocational training worth while.

The importance of providing some trade training to meet the needs of the small communities is indicated by the results of a few recent investigations which were made to determine the extent to which pupils completing industrial training courses in small communities stay in their respective communities and remain in the trade for which they were trained. These investigations which were made in a number of small communities maintaining industrial training, located in the northeastern part of the United States, show that 50 per cent of the pupils who completed trade courses remained in their respective communities and followed the line of work in which they received training.

INDUSTRIAL ARTS

In the field of the industrial arts critical attention continued to be focused upon details relative to the place and function of industrial arts courses in the curriculum of studies. While industrial arts training is now quite generally accepted as an essential phase of the general education program, the specific courses and subjects to be included for instruction, specific course objectives, methods of instruction, the school year in which the various units of work shall

be offered, and the question of requiring some industrial arts work of all boys are still the subject of much discussion.

Observation and study of present practices, together with a limited amount of statistical information, constitute the basis for the following implication as to tendencies in industrial arts education:

1. To make shop work in the industrial arts a required course somewhere in the junior high school grades.

2. To make the exploratory objective, including the development of general industrial intelligence, the principal aim of the industrial arts work at least through the first and second years of the junior high school grades.

3. To consider industrial arts as a general education subject, governed by the same principles as govern the purpose and organization of courses for general education training.

4. To establish the user's or consumer's values as the aim for any courses offered beyond those provided in the junior high school in accordance with the exploratory and industrial-intelligence objectives. Some advance has been made in theory and a little in practice relative to establishing a clear distinction between industrial courses in the senior high school offered as industrial arts courses in general education and vocational-industrial courses offered for employment purposes.

5. To organize instruction for the exploratory objective on the basis of the general shop type of course.

6. To increase the number of shop activities included in a course for realizing the exploratory aim. The tendency to break away from woodwork as the almost exclusive type of shop activity was especially noticeable in some States.

7. To standardize in a general way the activities, projects, and quality of work for the industrial arts in the junior high school grades.

8. To raise the qualifications for industrial arts teachers.

9. To provide a 4-year curriculum in industrial arts in teacher-training colleges.

10. To organize industrial arts clubs for project work on the interest and ability levels of junior high school pupils as an integral part of the industrial arts program.

The definite and clear-cut declaration that vocational-industrial education is for the specific purpose of providing efficient training for employment in some definite occupation in the field of trades and industries has left to industrial arts education all training of an industrial character that has as its aim the realization of general education objectives. It has also eliminated from the industrial arts work all training that is specifically for employment purposes. Regardless of how much these distinctions may be confused in practice, the prin-

ciple of differentiation remains true. Courses offered with assumed mixed objectives have resulted in inefficient programs that are neither good industrial arts nor good vocational-industrial work. Training which will give the best results for general education purposes—that is, for the purpose of exploration, for the development of general intelligence, and for the intelligent use of industrial products and services—is not effective preparation for employment in productive work in the trades and industries; neither is shop work given in accordance with a bona fide vocational objective suitable for realizing general education objectives in the industrial arts. The failure to organize industrial arts courses strictly in accordance with general education objectives results in a large factor of waste, both in time and money. Some progress was made during the past two years in organizing industrial arts courses for the purpose of realizing specific objectives. An example of this is the rather general attempt to organize the work in the junior high school grades so as to meet the needs of general education for exploration in manipulative work in common construction material with commonly used tools. The tendency, therefore, is to require all boys at some time in their junior high school course to take work in the industrial arts.

The tendency to offer a general shop course in the junior high school is strong. The movement looking toward provisions for a general shop type of experience instead of an experience in several unit trade shops is only a part of the general movement in all phases of education which has for its aim the differentiation between general and special courses with respect to objectives of training, content of instruction, and methods of teaching. The general shop represents a reaction in industrial arts against the practice of special subject teachers in all lines of work to offer a first course as if the students enrolling for it were going to carry on in the subject as a life occupation. A report of the State Department of Education of Michigan states that the general shop is becoming an established fact in industrial arts programs. A general shop course adaptable to ninth-grade pupils in rural agricultural schools is being tried out with excellent results in several places in the State. A report from the State Department of Education of New Jersey says that the trend in industrial arts began several years ago toward the development of the general shop has continued. While this tendency is most marked in the larger cities there are many small districts which are also demanding instruction of a general character. Utah reports that during the past two years the program for placing the exploratory general mechanics course in the junior high schools has made considerable progress.

Pennsylvania reports that in accordance with the recommendations of the State department of education the tendency is to make indus-

trial arts compulsory in the junior high school. In these grades, seventh to ninth, the industrial arts work is offered as an integral part of the general education program. In the larger centers the shops are usually organized as separate units. In the smaller communities where only one or two teachers are required for the work, several units in industrial arts work are offered in a general shop under the direction of one teacher. During the last few years there was a remarkable development in this type of work in Pennsylvania.

In some instances girls are taking certain industrial arts courses in the senior high school. An outstanding example of an industrial arts course in which girls are enrolled is the ceramics course in the Wheeling, W. Va., high school. Most excellent work is done in designing and making chinaware and pottery products. Persons with experience and talent, both in the art and production phase of the work, are employed as teachers. The pupils are interested and the quality of the products ranks high both as to design and workmanship. The work in ceramics in this school is an outstanding example of a successful attempt to develop a high-school industrial arts course in a line of work, represented in the local region, which is of an artistic trade character.

Another example of industrial arts work for girls is the craft work in art metal, basketry, and weaving offered in the Cass Technical High School of Detroit. Girls taking the prenurse course enroll in the craft courses for the value it may have for training in occupational therapy. Girls in a few schools throughout the country are enrolling for drafting courses, especially in blue-print reading with application to house planning and building.

A committee on standards of attainment in industrial arts teaching was appointed by the American Vocational Association. The committee proceeded to collect information which would show the consensus of opinion relative to specific attainments that should be held as standards in certain shop activities. A large number of persons experienced in industrial arts work were sent a list of specific operations in certain shop activities commonly included in industrial arts programs. Each person was asked to check the ones which he believed a boy should be able to perform at the close of the junior high school period. From these returns each operation was ranked according to its frequency of selection. The report of this study is of value for the suggestions it contains, based upon opinions of experts, for organizing and judging shop programs in industrial arts. At the present time the committee is making a study of the time allotment to projects in different shop activities.

The increasing use of electricity on the farm and in the home is stimulating the development of school courses in this subject in accordance with the user's or consumer's objective. This is espe-

cially true for the small and rural communities to which electrical service is now rapidly being extended. Estimates of the probable extension in the near future of the use of such electrical appliances to present nonusers run into the millions for each of such pieces of equipment as vacuum cleaners, radios, electric fans, electric refrigerators, electric sewing machines, electric percolators, electric ranges, electric irons and ironing machines, and electric washers. In addition, the greatly extended application of the electric motor to farm equipment and the installation on the farm of special electrical equipment involving the use of heat, light, and power are resulting in further demands for electrical work in agricultural communities served by electricity.

Definite agencies and programs are in existence for the specific purpose of promoting the use of electricity on the farm. An outstanding example of this is the National Rural Electric Project now carried on by the extension division of the University of Maryland in cooperation with a national committee representing manufacturers of electrical apparatus and with electric-power companies. The aim of this project is to promote the use of electric power and electrical equipment on the farm by means of the diffusion of intelligence as to their application and economic value in production work. This program is carried on by a series of continuous demonstrations on the farms. Certain farms are selected for demonstration of particular types of electrical appliances. The university with the cooperating agencies installs the equipment and furnishes instruction and supervision for its use, under contract that the farmer is to have the free use of it for a sufficiently long period to demonstrate its economic value. The cost of operation and maintenance is carefully kept. Similar projects under the control of the State committees are now carried on in approximately 27 States.

The present use of electrical apparatus in rural and small communities, together with the immediate prospects of the further installation of such equipment, is calling the attention of school people to the need for organizing courses in applied electricity, useful for training in the intelligent selection, use, operation, and care of electrical equipment that makes for home and farm conveniences and economies. During the past two years the programs of the smaller schools reflect this situation in a tendency to include some practical work in simple electric wiring and the installation and operation of simple electrical appliances used for heat, light, and power purposes.

ENTRANCE REQUIREMENTS TO INDUSTRIAL COURSES

Recently considerable attention, with some resulting change in practice, has been given to the question of entrance qualifications for

industrial classes. The practice of making trade courses, assumed to have bona fide vocational objectives, a dumping ground for the failures, the mentally dull, and the ne'er-do-wells in the elementary and junior high school grades and in the academic courses of the senior high school grades, is improving. Rather it should be said that some school systems are eliminating such practice while others are still continuing it in full force or in a modified form. It should be mentioned in this connection that the national vocational act, together with the regulations developed under it for the administration and supervision of federally aided vocational classes, has had a most wholesome effect upon the pernicious policy of admitting to vocational courses individuals who can not profit by the instruction. Federal and State plans governing Federal reimbursements aim to restrict enrollments to those for whom such training will be feasible and practicable. However, in some school systems there are yet frequently found classes, not subject to a State plan for vocational education as are classes receiving Federal aid, for which the objectives of training are mixed and which are without any single standard as regards entrance requirements.

The present general tendency is to upgrade entrance requirements for the all-day trade-preparatory school, and for admission to part-time and evening courses to emphasize the prospects of the individual capitalizing on the training, as indicated by the line of work in which he is employed at the time. Specialization in industry and the increased use of labor-saving machinery, together with all the factors making for an easy labor market, are influencing employment conditions, and personnel officers in large industrial plants are becoming more critical with regard to the selection and retention of employees. Consequently, industrial schools which turn out students poorly prepared to compete for employment in the trades and industries are made to realize that their vocational courses are not functioning as they should. As a result, the increasing tendency to deal more discriminatingly with applications for admission to vocational-industrial courses was rather pronounced during the past two years. These higher standards for admission to trade schools have come as the result of many years of experience and development in industrial education. A score of years ago the proposal to organize a trade school "open at the bottom" so that practically any one might undertake to learn a skilled trade, met with a good deal of popular approval. It was heralded as an idea which would solve the problem of the further education of those not completing the grade school and serve as a means for filling the gap in the provisions of the public schools for furnishing educational opportunities for all classes. But as the years passed more critical consideration was given by school administrators to the abilities necessary for becoming an effi-

cient worker in a trade requiring a high degree of skill and a considerable body of trade and technical knowledge. The need for a selective influence governing admission to trade courses was making itself manifest. Some school systems have now made the completion of the eighth grade of the elementary school a first condition for admission to the all-day trade school, thus corresponding to the requirements for admission to the regular high schools. Others have set as entrance requirements the completion of the sixth grade plus regulations as to age and physical maturity.

CLASSES FOR THE RETARDED

The growing practice of denying to mentally slow and retarded pupils admission to vocational-industrial courses is accompanied by the question of what provisions to make for this group of pupils. A study of the history of the development of industrial courses in almost any city will reveal the fact that in the past there was a general assumption on the part of most persons in the field of general education that shop work was a panacea for all mentally retarded, over-age, disinterested, and incorrigible boys. Practice indicated a rather general belief that shop work would create a new interest that would lead to school success, that the boy with low mentality would succeed in a trade course, become a skilled workman and a self-supporting and self-respecting citizen, and that the incorrigible would become tractable and obedient through shop experience. In general the working assumption of academic teachers was that those pupils who lacked ability to develop mental skills possessed ability to develop manual skills; that the absence of the former in some way inferred the presence of the latter. As a consequence when academic teachers pronounced a pupil a failure in their lines of work their inevitable recommendation was that the boy should be given shop work and learn a trade. Too often the public-school officials responsible for the transfer of students from one class or school to another would follow the recommendation and assign the boy to the vocational school, where it was presumed he would learn his arithmetic through the motivation he would receive from shop projects and that he would learn to use good English by talking and writing about shop work.

Shop courses, however, have not been able to work any such magic. The results of psychological studies involving individual differences and the relation of mental and manual types of reactions, together with many sad experiences resulting from attempts to give dull pupils a renascence through shop experiences, all indicate that it is highly probable that a pupil who is deficient in abilities to succeed in elementary academic school subjects is also deficient in abili-

ties necessary for becoming a skilled and successful worker in the trades. As a result of this changing attitude more attention than formerly was given to provisions for organizing classes and programs in shopwork which would be feasible and practicable for this rather large group of pupils. School systems which have made an effort to provide shop training of a character to meet best their needs have frequently proceeded along different lines. Some of the common arrangements include:

1. A segregated group with a special teacher in the same building and using the same shops and equipment along with the regular pupils, but in a differentiated course and frequently devoting an extra amount of time to shop work.

2. Inclusion of the retarded pupils with the regular pupils in shop work under the same instructor. It is usually assumed under this plan that some provision for individual instruction will be made that will help meet the needs of the retarded pupil. This plan is often merely an administrative device for taking care of the backward pupils, and unless definite plans are made whereby it is possible for the teacher to give considerable special attention to these pupils their needs are not met. If he does this, the regular group usually suffers; if he does not, the result is that the retarded pupil is merely neglected.

3. Administration plans for the segregation of pupils in special schools with adjusted shop courses.

Any plan for providing suitable shop instruction for mentally retarded and backward pupils should be made to fit into the general scheme for industrial courses, as the inclusion or exclusion of this group of pupils for instruction in the regular schools will affect the character and plans for instruction in these schools. An outstanding example of an industrial program in a city school system designed to meet the needs of all classes of pupils is found in the city of Buffalo, N. Y. That city maintains four 4-year industrial high schools with an enrollment of about 2,500 day pupils and the shop work is organized strictly in accordance with the vocational objective. One of the entrance requirements to the day classes is that the applicant must have successfully completed the elementary school grades. This requirement is rigidly enforced and the result is that the pupils enrolled in vocational classes are a selected group, which is an essential for efficient vocational training. For pupils of elementary and junior high school age making normal school progress 100 shops are maintained for industrial arts work. Buffalo, however, does not stop with provisions for vocational and industrial arts work for pupils making normal school progress. By means of quite a complete system of special schools and classes provisions for industrial

training are made to meet the needs of special groups. There are a half dozen or more special schools to which pupils failing to make satisfactory progress in their academic subjects can be assigned. In these schools one-third or more of the time of the school program is given to practical types of industrial work. No attempt is made to offer unit trade courses in these schools. The object is to provide practical shop work, sometimes of a general, sometimes of a specific character depending upon group needs, that will help the boy to make adjustments to employment conditions in industry when he leaves school. A sufficient amount of shop work in leather, metal, wood, and electricity is given to familiarize the boy in a general way with elementary construction work in common materials by the use of hand tools and a few machines, and to furnish him a basis of appreciation for working conditions in a commercial shop.

In addition to these special schools for slow and mentally retarded pupils there is also an "opportunity school," which performs work which is interesting and which is valuable to society, in giving an additional and final chance for the nonconformist, the overage and mentally slow boy to accomplish something that will be an inspiration to his morale before his final separation from the public school. The group of 200 boys enrolled in this school is a heterogeneous one with a wide range in ages, both chronological and mental. The daily program is divided equally between general class work and shop activities. The shop work includes machine shop practice, sheet metal, woodwork, broom making, cobbling, and chair caning. The teachers are well qualified for dealing with the particular type of boy sent to this school. The shopmen are skilled mechanics, interested in boys, and the instruction is good. The shop work is of a practical character, much of it of a trade nature. Broom making is given strictly as trade training. The brooms meet a commercial standard and are sold on the market.

Shop work is provided in yet another type of school in Buffalo, the continuation school. For the boys and girls in employment under the part-time law, practical types of work are furnished in the continuation school. Boys have an opportunity to enroll in courses offering training in drafting, printing composition, commercial art, electricity, automechanics, printing press work, machine shop work, woodworking, and plumbing. During the year 1929–30 a total of 3,746 boys was enrolled in the continuation school. The highest weekly registration of boys was 3,118.

FOUR-YEAR COURSES

In some places there is a tendency with respect to full-time classes to organize both trade and technical subjects as 4-year courses in high

schools, both of the special and regular types. Several factors more or less varied are contributing to this movement. Among them are:

1. The tendency for pupils in the upper school years to continue in school over a longer period of time. Between 1917 and 1928 the percentage of the total school enrollment included in the third and fourth years of high school practically doubled. For the third year of high school the percentage in 1917 was 1.57 per cent; in 1928 it was 3.05 per cent. For the fourth year the percentage was 1.22 in 1917, and in 1928 it was 2.47.

2. The desire to obtain a diploma from a 4-year secondary school.

3. The development and organization of more content material for trade and technical courses. In some courses, auto mechanics for example, the content material has been greatly expanded by the inclusion of additional units of instruction in shop and laboratory work.

4. The desire to obtain increased State aid. In some instances more State aid is given if trade and technical courses are organized in some kind of high or secondary school.

5. Increasing age for entering employment. Legal regulations and employment conditions in the industries are making it more and more difficult for pupils of normal high school age to obtain work.

6. Higher qualifications for admission to trade and technical schools. Pupils who must meet regular high-school entrance requirements in order to be admitted to trade courses have qualified for secondary school work and naturally want secondary school credit for any further school work.

According to the regents' rules in New York State, which went into effect in 1928, and the regulations of the State commissioner of education, industrial high schools offering unit trade courses may be established and maintained by the board of education of any city or school district, or the vocational education and extension board of any county. Schools coming under these regulations are to be organized as separate units and must meet certain required standards relative to their ability to provide efficient instruction in industrial and trade work, including approval of courses of study and equipment. An industrial high school may offer 1, 2, 3, or 4 year courses.

The minimum length for the school day is six hours, with 50 per cent of the time given to practical work in a unit-trade subject, 25 per cent to general subjects, and 25 per cent to related technical subjects. Teachers are required to hold special licenses for vocational work.

The four 4-year industrial high schools of Buffalo, organized under these State regulations, are outstanding examples of vocational schools undergoing transformation into 4-year industrial high schools. They are meeting a demand for good trade instruction in a

large variety of courses which carries recognition for secondary school work.

There are certain cautions, however, to be kept in mind in providing 4-year trade courses in a high school. The city school system has a responsibility for providing industrial training for those who will not complete a 4-year course. It is important that training in special and short unit courses to meet the needs of this class shall not be neglected. It is also necessary to make careful studies to determine if the content of a given trade occupation is sufficient to warrant a 4-year course. In the industrial high schools of Buffalo a very careful and thorough analysis of each trade course is in progress to ascertain the advisability of expanding it into a 4-year course.

The question of the character and place of 4-year technical courses is also in the foreground of the problems in industrial education demanding the attention of educational leaders in certain parts of the country. For many years institutions of college grade have offered technical courses of a professional type and many secondary schools have offered a 4-year general technical course. The technical curriculum in the secondary schools, however, was of a college preparatory type, consequently its values were largely propædeutic. With the passage of the national vocational act in 1917 attention was called to the need for a limited amount of technical instruction definitely related to a specific trade course. Between two occupational extremes, represented by the engineer and the tradesman, there is a great body of industrial workers who need training of a character and amount in excess of that necessary for the journeyman tradesman but less than that required for the engineer. For this great group of workers very little technical instruction is provided. Occasionally some progressive school system has sensed this need and initiated attempts to provide types of training to meet it. The State Department of Education of New Jersey reports that there is an increasing demand in industry for superior types of high-school boys who have had technical training of less than college grade. As a result a number of districts in New Jersey are becoming interested in this type of work and are considering the establishment of courses to meet this need.

New York State has set up standards for the establishment of technical courses closely related to some particular industry, for example, a 4-year technical course in electricity. These technical courses provide a good basic training such as is needed for entrance to junior engineering occupations. The State department of education sets up five specific aims of a unit technical high-school course as follows:

1. To make clear to the pupil the opportunities that exist for junior workers in the various technical fields.

2. To give the pupil training in the more easily mastered fundamental theories and practices of the technical occupations which he desires to follow.

3. To give the pupil thorough preparation in the pure and applied mathematics and science which a junior worker in a special technical field must obtain.

4. To give the pupil a good general knowledge of the tools, materials, processes, and methods used in the practical construction or production work to which the special technical service relates.

5. To give the pupil the use of modern technical methods in the solving of problems in some one technical field.

The high-school diploma in technical subjects is issued only for a registered 4-year technical high school offering courses in one or more of the following fields: Architecture and building construction; power generation; chemistry; electricity; mechanics; and textiles—marketing, chemistry and dyeing, mill building and operation, costume making, and cloth construction. It is expected that the student earn at least half of his total high-school credits in the technical field which he is pursuing. Four units of work are required in mathematics and science. The school day is from 6 to 7 hours in length.

Teachers of technical subjects in order to obtain a license are required to have three years of approved technical experience in the field or fields to be taught. To meet the requirement for general or technical education the applicant must have satisfactorily completed four years of approved work of collegiate grade in engineering, science, or architecture. To meet the professional requirement, he must have satisfactorily completed 90 hours of approved professional teacher-training work. The teacher of shop work in the unit technical schools is required to have had five years of approved training in the journeyman grade in the trade he expects to teach. The general educational requirement is the satisfactory completion of the first year of work in an approved high school or its equivalent, and that in professional training is the completion of the required courses of the extension vocational teacher-training curriculum of the State.

AVIATION

Interest in aviation as a public-school course greatly increased during the biennium. The strong belief that aviation will constitute a principal method of transportation in the future, together with the novel attraction it holds for youth, is resulting in a strong demand for its inclusion as a subject in the school curriculum. As is frequently the case when a general desire is expressed for school training in a new subject, the desire in some instances outruns any well-thought-out procedure as to feasible objectives, efficient methods of instruction, adequate equipment, qualified teachers, and curriculum

projects. At the present time there is a strong tendency to offer instruction in subjects related in some way to aviation in both the junior and senior high schools. Present practice is to include as school activities: Model aircraft building (usually in the junior high-school grades); instruction of a general information character; practical instruction in subjects related to aviation, such as drafting, gas-engine work in the automobile shop, and woodwork in the construction of airplane parts; and training of a vocational character in some specific occupation in aviation.

The work offered in different schools varies greatly in variety and quality, but requests for information coming to the Office of Education indicate a widespread need for the organization of instruction in a way that will serve better some specific objective that will have functional value in life activities. The construction of model aircraft in the junior high school, when of a character corresponding to the accomplishment ability of the pupils, constitutes a valuable project in the industrial arts and one which is strictly in accord with the interest levels of the pupils in these grades. Not only is the number of schools including such work in their industrial-arts programs rapidly increasing but the quality of the work is also much improved. The designs and construction follow much more definitely the principles governing the construction of commercial craft. Recently considerable attention has been given to building gliders. Construction work in this type of aircraft is proving to be both a popular and valuable project in industrial-arts work.

While there was some increase in the number of schools offering a course in aviation with an avowed vocational objective, the greatest progress was made in the improvement of the character of the training. Leaders in industrial education recognized the fact that if an efficient program in aviation was to be realized it would be necessary to offer courses in some specific phase of the work which would be in accordance with commercial standards and in which employment could be reasonably expected on completion of training. To those who were making a thorough study of the possibilities of developing training with a true vocational objective in some phase of aeronautics it was apparent that care should be exercised in the selection not only of the types of work to be undertaken but also of the individuals to be admitted to training. It was early realized that the number who wished to become pilots was far in excess of the opportunities for employment as aviators. Attention, therefore, was centered more upon groundwork and work connected with the manufacture of airplanes. Cities in which airports or factories for the building of airplanes are located have the advantage in attempts to develop efficient courses in aeronautical lines of work. In such cities the opportunities are present for securing the cooperation of individuals and com-

mercial companies actively engaged in aeronautical work. Valuable service is rendered by these commercial agencies and individuals in the organization of a training program, in obtaining qualified teachers, in securing proper equipment, and in the selection and placement of trainees.

The program at the Burgard 4-year industrial high school of Buffalo, N. Y., is an example of the successful development of vocational courses in aeronautics. The public schools have secured the assistance both of the manufacturer of airplanes and the personnel of the airport of that city in providing proper instruction to meet the local needs for trained men. Four-year courses are offered which include training in aircraft construction and repair, aircraft machine shop practice, aircraft electrical repair, aircraft welding, aerodynamics, and meteorology and air navigation. One-half day for four years is spent in shops completely equipped for the particular kind of instruction offered, the other half day is given to regular high-school subjects and vocational-related work in science, mathematics, and drafting. Six shops are devoted to work in aviation. There is an especially equipped shop for advanced airplane construction, advanced aircraft engine repair, airplane welding, aircraft electrical work, and air plane machine-shop practice. The large tower of the building is used for the study of meteorology and air navigation and is equipped with such instruments as wind and speed dials, cloud indicators, and barometers. In addition there is a drafting and blue-print room for instruction in reading and making airplane drawings. The school has 8 complete airplanes, 30 airplane engines, and numerous airplane parts. The shops are equipped with overhead tracks, electric hoists for lifting and conveying motors, and an exhaust system for removing fuel gases from running motors. All instruction is specific. Some courses are organized on the definite requests of industries to meet their own immediate needs for men trained in some special line of work. The instructors are men with practical experience. In some instances the teachers are men from the industries who are employed by the school to give a specific course. The school accommodates 150 day students. At night, 250 are enrolled for instruction, including classes in theory and related subjects. Hundreds seeking admission are turned away.

PRODUCTION JOBS

Heads of industrial arts departments frequently encounter difficulties in their attempts to provide shop experiences of a character that will best give the pupils an insight into commercial methods of production. The limited time usually given to industrial-arts work makes it especially difficult to include in the shop program jobs on a

quantity basis. The time required for giving the pupils a general and varied type of shop experience in accordance with the exploratory objective leaves but little opportunity for repetitive work. The inclusion, therefore, in the industrial-arts program of a considerable number of jobs having similar learning difficulties with approximately the same degree of intensity constitutes a real problem. Some repetitive jobs, however, are essential if the pupils are to acquire in any degree speed and skills in manipulative phases of shop work and ideas of commercial standards for quantity output.

Another reason for not including commercial jobs on a quantity basis, is the strain that is frequently placed on the industrial-arts programs by the demands of the school or board of education for repair and production jobs. Often consecutive jobs coming from a board of education are of a miscellaneous character and involve widely dissimilar learning difficulties as well as great differences in the degree of skills required for their performance. This interferes with the instructional order of the shop program and makes training difficult. Instructors also find it difficult to organize the shop for work on a quantity basis. As a rule only the advanced students in the industrial-arts courses can be used to advantage for the purpose; the equipment often is not adequate, and special equipment such as gigs and fixtures must be designed and made for insuring accuracy and speed in the production processes; the regular jobs carried on by other classes using the shop are in the way; and the continuity of the production work is broken up by the short periods that the boys are assigned to the shop and the long intervals which follow before the work can be resumed.

Recently there has been a growing interest in commercial jobs on a production basis for advanced pupils in industrial arts work. Various plans have been undertaken to overcome the obstacles mentioned. In certain instances considerable success has been attained in providing some suitable work that will give the pupils a limited amount of experience on production jobs in accordance, to some extent at least, with commercial methods. Some schools have set aside a definite time in the shop program to be used for making mechanical toys of a commercial character in quantities that can be disposed of by the school. A few schools have provided for one or two jobs of a commercial character in which the work can be specialized on a quantity production basis, and have made these jobs the order of work for the last part of the industrial shop course. Other schools have taken advantage of commercial jobs coming from the board of education and planned in advance to fit them into the instructional order of the shop work at different times in the year when it is feasible to include them as a regular part of the shop

program. The cooperation of those requesting work of the industrial arts shop in planning their needs in advance, thus preventing requests for rush orders, is an important factor making for the success of this plan. Certain types of printing jobs, electrical jobs, construction and repair jobs can be utilized when arranged for in time to make them a unit part of the shop work.

The industrial arts department of the Cincinnati public schools has adopted a plan for doing certain kinds of commercial jobs coming in quantity orders from the board of education that largely overcomes these difficulties. As long as 15 years ago the manufacture of school furniture was undertaken in school shops because it provided an opportunity to develop quantity production methods, thus revealing to boys modern industrial practices as compared with the old craft, or hand processes. The results were so satisfactory to the board of education that the demand for production increased beyond the ability of the shops to do the work within the limits of the ordinary school program. To meet this demand and to take advantage of the opportunity to do production work on so large a scale, groups of boys from industrial arts classes were organized to carry on the work more intensively during the summer vacation periods. Recently the development of the work has been stimulated by the need for special furniture in the reorganization of the primary grades. The summer work is now largely centered in the shops of one of the junior high schools where the conditions are best adapted to this type of work in that the shops are located in a building once used as a factory.

Quite a variety of jobs are included in this summer work. Work tables, sand tables, work benches, easels, ferneries, and other furniture for the primary grades have been made in large quantities. All of these were of original design and substantially constructed. It is also the custom to maintain so far as possible the equipment for all industrial arts shops. Work benches, woodwork vises, drawing tables, drawing boards, drawing-board cabinets, type-case stands, and paint-spray booths are among the many pieces of equipment that have been designed and built by vacation groups. In addition, electric power and light lines have been installed.

The teachers for the summer work are very carefully chosen to meet the specific demands of the organization of the vacation shop. The number of teachers employed varies with the amount of orders received for summer work. To each teacher are assigned seven or eight boys who are selected on the recommendation of their shop teachers from various junior and senior high schools of the city.

In selecting the boys no particular emphasis is placed on their probable future vocation. Most of them have been members of industrial arts classes, taking the work as a part of their general education.

Their participation in the summer class for making school equipment is justified on the ground that it is a wholesome thing for any boy to work, especially in the type of organization and environment provided by this vacation work.

In the development of the summer program in Cincinnati the following objectives and principles of procedure have been kept constantly in mind:

To provide opportunities for intensive application to specific construction problems by working 8 hours a day for a period of 6 or 7 weeks.

To reveal to boys the economic advantage of the division of labor on quantity production problems.

To encourage the development of original practices through the use of machines and special devices.

To pay a nominal wage to the boys in order to initiate them into the wage-earning group under favorable conditions. There are no snap jobs in the vacation work.

To provide as wide a variety of experiences for each boy as is consistent with the necessity of specialization. The boys are given a variety of experiences in different phases of trade work, including metal work, woodwork on machines, assembling jobs, and wood finishing jobs.

The Cincinnati plan for vacation shop work on quantity production jobs for the schools, carried on under the direction and supervision of men highly qualified to organize production work according to good commercial shop standards, provides for the boys admitted to this group a type of shop experience which they would scarcely be able to obtain in any other way. Under the immediate supervision of competent men in each of the different types of work included, the experience which the boys have taxes their power of concentration, their ability to accept responsibility, and their ingenuity. Since the summer work is limited to making products which the board of education would otherwise buy, and are produced at a cost not to exceed commercial prices, these worth-while experiences for boys have been made possible without additional cost to the board of education.

GUIDANCE

A great deal of activity was manifested during the past biennium in the field of guidance. Membership in guidance associations increased, additional associations were organized, a national advisory committee composed of outstanding leaders in education was formed, and a national vocational guidance committee on State guidance programs with a personnel ranking high among the leaders in the guidance movement came as an outgrowth of the work of the National Vocational Guidance Association. The development of organizations interested in promoting guidance is indicative of the increase in guidance literature, in guidance programs in the schools, and in the number of guidance studies which were made. A large number of occu-

pational studies each contributing information relative to the nature of the work in a given occupation; the necessary training and experience for entering the occupation; and the working conditions in the occupation were prepared and published. Many of these were issued by public-school systems, others by individuals and private agencies. The development of appropriate and usable literature on occupational studies was one of the largest contributions made to the guidance movement during the biennium. The need for guidance as a school activity is now generally recognized; guidance as an organized part of the public-school program, however, is still in the developmental and experimental stages. For this reason programs of guidance associations largely centered about plans for organizing and carrying on guidance work. Publications on guidance chiefly dealt with the philosophy, principles, and theories underlying guidance as the various authors conceived of them.

There is quite a general agreement, however, to certain needs that should be met by guidance programs and certain guidance functions that should be performed. For example (1), the need for occupational studies that will make sure that high-school students have an opportunity to analyze the major vocational groups and some of the occupation levels within the major vocational fields; (2) the need for counseling, including individual counseling, as an essential part of a guidance program; (3) the need for a vocational guidance program that will include placement and follow-up work; (4) the need for studying the individual relative to his aptitudes, interests, health, and social and economic status as these may affect his opportunity for a successful career.

There are still many problems in guidance which have not been sufficiently studied and tried out in practice to unify opinion in regard to them. Among such questions are: The placement and function of tests and measurements in a guidance program, the organization and direction of counseling work, the qualifications of counselors, the administrative organization of guidance in a school program, the various activities which should be included in a guidance program, and the relation of guidance and placement to the issuance of work certificates.

Some of these problems are the result of treating different phases of guidance as separate and distinct units, functioning independently under different administrative and supervisory divisions. Guidance, however, is a unit and all phases should be integrated for a common purpose; it is as broad as education itself and should be made a unified process in an educational program.

Progress was made during the biennium in the development of State and local guidance programs. Nine States now have guidance

programs under way. Seven of these were started during the past two years. The official in the State department of education in whom the guidance work centers varies with the different States. A few States have a director either of guidance or vocational guidance. In some States the person in charge of secondary education is also in charge of the guidance work. In some instances the person having responsibility for the guidance program of a State is a member of the staff of the attendance division or a person dealing with the school curriculum.

In Ohio there has been created a division of guidance in the State department of education with a director at its head. Considerable time is spent by the director in traveling about the State assisting local schools in the development of plans for a guidance program. Several publications on guidance have been issued by the State department, one of which is a manual for teachers. In Pennsylvania there is a State plan for guidance under which the counties organize their own programs. Forty-eight counties in the State have inaugurated guidance programs. More than 700 schools have counselors or advisers devoting full time or part time to these activities. New York State in 1927 enacted legislation setting up a State program of guidance and providing for a full-time State supervisor. In Virginia programs were organized on a county basis. In North Carolina a committee on guidance has been appointed to plan methods for guidance work. In both California and Washington the State department of education has issued a publication on guidance.

A few local studies have been made of the vocational interests of high-school students as they have expressed them in response to the question as to what specific line of work they desire to enter as a life occupation. An analysis of the results of such studies usually reveals a wide disparity between the vocational interests—probably better expressed by vocational desires, and the probabilities that any considerable percentage will be able to follow the vocation of their choice. The report of such a study, recently made in an eastern city having a population in excess of 50,000, will serve as an example of the correctness of this statement. In the high school of that city 2,626 students, of whom 1,691 were boys and 935 were girls, expressed a vocational choice. A little more than 300 expressed no decision as to a life career. Percentages computed for the vocations which attracted the larger number of students show that 17 per cent wish to become teachers, 13 per cent to enter secretarial work, 12 per cent to become engineers in different fields of this profession, 9 per cent to follow aviation, 8 per cent to become nurses, 1.8 per cent to enter the medical profession, 1.6 per cent to become lawyers, 0.08 per cent to become pharmacists, 0.08 per cent foresters, 0.05 per cent dentists,

0.05 per cent ministers. The other choices were distributed among a wide range of occupations, such as social service, scientific research, agriculture, optometry, mining, metallurgy, and dramatics.

Regardless of the fact that for the school year ending June, 1930, approximately 700 pupils in this school were reported as enrolled in "industrial and technical training (trade courses)," little interest is evinced by students in trade and industrial occupations. Moreover, with few exceptions, the vocations would require training beyond the high-school level. However, an examination of data reported for that school shows that for the year 1929–30, only 17 per cent of the students were enrolled in the senior year, thus indicating that a considerable percentage of the students will not finish high school. In addition, not all of the graduates continue their education beyond high school. Only 18 per cent of those graduating in 1929 entered college and only 9 per cent additional entered some other institution such as a business college or normal school.

The foregoing situation reveals the need for organizing work in guidance that will enable pupils to obtain a clearer conception than this report indicates of the work of the world and the distribution of workers according to occupations. Frequently schools make provision for persons from various occupations to speak to groups of pupils for guidance purposes relative to their respective lines of work. The school referred to in this report does more than provide a series of talks. It has arranged that on certain days persons from various occupations come to the school and do individual counseling with pupils relative to the occupational field in which they are respectively interested. A counselor is provided for each of the following occupational fields: Aviation; architecture; art; dentistry; domestic science; business; secretarial work, accountancy, and salesmanship; engineering; forestry, agriculture, and horticulture; law; medicine; music; nursing; military service; pharmacy; physical training; teaching social service and ministry; trades; and journalism. The field of trades collectively is covered by one person.

The distribution of emphasis in this counseling program probably accords with practice in other general high schools. However, when the fact is considered that of all persons in the United States 10 years of age and over engaged in gainful occupations in 1920, only 5.2 per cent were in professional service, it is evident that some change in emphasis in high-school programs of training and guidance is needed. Most of the general high schools still represent a secondary type of education that is of a highly selective character. Even though in this type of school the curriculum of studies has been broadened to include trade and other kinds of vocational courses, the whole atmosphere of the school and the background of school experi-

ences and activities are such as to point toward college and to direct interests in life careers, in so far as any are aroused, to vocations for which college training is necessary. Under such circumstances it is difficult for vocational courses to have a fair chance for success.

A critical attitude has been manifested during the past few years toward the use of mechanical aptitude tests. However, the search for objective tests that will assist industrial-school supervisors in the selection, classification, and promotion of students in industrial work has gone forward with considerable vigor. The development of nonstandardized objective tests for specific lines of work has made considerable progress during the past two years. A considerable number of teachers in different cities over the country have been working on the development of objective forms of tests in special subjects for the purpose of evaluating the work of their pupils. Probably the most significant results in the test and measurement work have been attained along this line of endeavor. A few individuals have also been working on the problem of developing criteria to be used in the selection and retention of pupils in trade and industrial courses.

In one of the large cities with an extensive program in trade and industrial education an experienced shop teacher trained in tests and measurements was added to the vocational staff to devote full time to the study of students enrolled in trade courses Studies have been undertaken in that city to determine some of the factors involved in the failure of students in industrial classes. The city does not require the completion of the elementary school as a condition for entering the trade school. In general, pupils are admitted to trade classes if they are as much as 14 years of age and have completed approximately the first six grades of the public school and give evidence of ability to profit by the instruction. The entering group, therefore, is not a highly selected one with reference to academic education. The expert has undertaken a study of the pupils failing at the end of their first semester's work in the trade schools. [illegible]ch of these pupils was given three different mechanical tests. [illegible]esults showed that 90 per cent of the pupils who had failed were below the median for the pupils of the trade school on one mechanical test, 82 per cent on another, and 76 per cent on the third mechanical test. It is planned to continue this study with future classes for the purpose of determining the reliability of the results. If the results of the first test are substantiated by a sufficiently large number of pupils, the evidence will be strong that there is a relation between scores made on these mechanical tests and the chances for success in trade-school work. In such an event the tests would have value as a factor in the selection of pupils to be admitted to trade courses.

This, however, does not necessarily imply that tests labeled "mechanical tests" actually measure mechanical aptitudes. It may be possible that the factor or factors in the test which correlate with school failure are not mechanical aptitude. It may be some factor in intelligence, personality, or emotional stability. The study is one well worth further investigation by means of different kinds of tests and other instrumentalities for determining as accurately as possible all forces which may influence school success.

TEACHER TRAINING

One of the questions which has continually confronted administrators of industrial-education programs is that of an adequate supply of properly trained teachers. The preparation of teachers is not only one of the essential aspects of trade and industrial education but one which must precede any efficient vocational instruction. This fact was recognized by the leaders in the early movement for vocational-industrial programs in the public schools. It was felt by those in charge of the drafting of national legislation that it would not be sufficient to make provisions for Federal aid to industrial training without providing funds to aid in the preparation of a sufficient number of qualified teachers to insure the effective carrying out of the provisions for industrial training. The national vocational education act in 1917, therefore, contained provisions for the reimbursement of the salaries of those employed in the training of industrial teachers in the same manner as for teachers of vocational classes. In addition it included provisions for withholding Federal reimbursements for vocational education from those States that did not at a certain date meet the requirements for teacher training as provided in the act.

During the past two years leaders in industrial education gave considerable attention to the question of what constitutes an adequate and effective program for training industrial teachers. This was reflected in the programs of teachers' associations, in the industrial arts literature of the period, and in conference discussions by officials in this phase of education. Discussions taken as a whole were quite critical of certain features of the plans and programs in effect. They, however, dealt with the situation in a constructive manner and offered suggestions for meeting some of the inadequacies of existing methods of training.

The problem of the adequate preparation of industrial teachers involves the selection of properly qualified applicants for enrollment in teacher-training courses. This in turn necessitates the determination of certain basic qualifications for industrial teachers. Those who have had experience in carrying on successful programs

of training for employment in trades and industries have long maintained that the first essential qualification for the teacher of a trade subject is a number of years of experience as a journeyman workman in the trade he expects to teach. The developments in industrial education during the past decade wholly justify this basic assumption and have made it possible for administrators and supervisors to demand that the first essential qualification for a teacher of a trade subject shall be an adequate experience in the trade which he is employed to teach.

With the trade qualification so universally accepted as a condition for employment as a teacher, the progressive leaders in industrial education during the past two years were enabled to argue with clarity and force for a type of teacher-training work in accord with this preestablished teacher qualification. As a result more attention than previously was given to the selection and treatment of subjects to be included in a teacher-training program which would be most efficient in making a tradesman a teacher of his trade. Not only the subjects to be included in the teacher-training curriculum, but the whole plan for the organization, administration, and method of conducting teacher-training courses became the subject of much constructive criticism.

The emphasis placed upon trade experience for shop teachers brought into the foreground the question of trade experience as a qualification for related-subjects teachers. The criterion for determining what any teacher should know and be able to teach can always be ascertained from the objectives set up for the instruction, namely, the development of abilities to perform certain specific tasks. While the use of this principle for the determination of qualifications of teachers was no new experience to leaders in industrial education, it did receive a new emphasis by them during the past two years. It was reemphasized in order to impress those responsible for the selection of related-subjects teachers and those responsible for teacher training with the necessity for selecting teachers with industrial experience for teaching related-subject matter and for organizing teacher-training courses to meet the needs of persons with these qualifications. It was pointed out that the abilities needed for performing work jobs in a given trade require knowledge of certain scientific facts, mathematical computations, and graphic representations, such as working drawings, but that the knowledge needed in any of these is not that of pure science. Only the ability to make application of facts as determined by science is needed for the performance of specific jobs in the trade.

Particularly has the question of the relative values of pre-employment and in-service training of teachers and the place of each in a teacher-training program been in the foreground in the past two

years. In-service training is more and more looked upon as a supervisory responsibility of local and State officials. Assistance given to individual teachers during visitations by these officials is an effective method of training. All psychological factors are favorable for its functioning. It comes at a time when a teacher is in need of it; the situation is at hand for its application and the results can be quickly checked. In-service training also includes assistance by supervisory officials in planning class organization, methods of instruction for special phases of the work, and job and operation sheets to be put into the hands of the individual students. The interest of the teacher is great at this time and as a rule he applies himself assiduously to the tasks which will improve the efficiency of his classroom work. Again in-service training is about the only type of teacher-training work that can be carried on with evening instructors. Frequently teachers of evening classes are secured from the trade where they are employed during the day. The commercial shop is probably the best source of evening school teachers, but they need short and intensive courses of a specific character to aid them in laying out their work in an instructional order and in the presentation of it to their classes in accordance with good principles of teaching.

Pre-employment teacher training is effective if properly organized with reference to the subjects to be included, the methods of instruction to be used, and the selection of candidates for the course. Care should be exercised in the selection of individuals for pre-employment training in order to determine that each individual has had sufficient trade training to warrant his profiting by the instruction offered. The group should not include those who are taking it merely as a subject for which they may receive credit. In such a situation general educational objectives are liable to become predominant in the work of the course, and the specific type of training needed for making a shop teacher be neglected.

Recently there have been pronouncements against the character of subjects included in industrial teacher-training programs. Such subjects as general psychology, history of education, and general methods courses have become a target of those leaders in industrial education who believe in the inclusion in the program of studies only those subjects which have direct and immediate bearing upon the efficiency of instruction in industrial subjects. This does not mean that one who expects to become a teacher of shop subjects should not take any of the above-mentioned subjects, but it does mean that they shall not be counted as specific training for shop teaching. No objection is raised to a shop teacher being a college graduate, but objection is made to a college graduate becoming a

shop teacher unless he is a qualified and experienced tradesman with necessary preparation for teaching. The first essential always for a shop teacher is that he be a tradesman. Being that, it is quite possible to give him a short preemployment training course, followed by in-service training and training during summer vacations that will make him an efficient teacher.

SUMMARY AND CONCLUSION

1. The range of occupations included in trade and industrial education is increasing. The number of occupations represented in unit-trade day-school programs has almost doubled in the past half dozen years. The spread of occupations included in part-time and evening courses is probably even greater, due to the fact that it is often feasible and advisable to provide training for persons already employed in certain types of work, but for which it would not be advisable to provide training on a preemployment basis. Such specific occupations as flower making, meat cutting and packing, and box making are now found among the subjects offered in various types of industrial classes.

2. Trade training in the past has largely been for certain highly skilled trades. It is now beginning to be recognized that some semi-skilled lines of work, for which only a comparatively short period of training is necessary, constitute a legitimate and useful field for school training. For example, short courses for training in window washing, cosmetology, and in certain janitorial services are now offered in some places where there is a demand for trained workers in these occupations.

3. Specialization in industry has resulted in the development of a great many more jobs than existed a few years ago. The improvement and extended use of machinery are contributing factors to this situation. Schools are recognizing more clearly than ever before that it is not sufficient to offer only comprehensive trade courses, such as the machinist's trade, but that it is necessary to provide training in specialized jobs. For example, schools are providing courses in drill press and lathe work to prepare individuals for specific employment in the operation of these machines.

4. During the past two years more attention than formerly has been given to the efficiency of public-school programs in trade and industrial education. Administrative and supervisory officers generally have sought to develop programs with a view to obtaining the maximum amount of training for each dollar expended. This has resulted partly from the general movement to reduce school costs to a minimum consistent with good standards of accomplishment and partly to a movement originating in the field of industrial education

types of work. In such cases the schools are confronted with the necessity of discarding such obsolete equipment and purchasing other equipment suitable for the new lines of work.

12. Considerable critical attention has been given during the past two years to the subject of the selection and training of industrial teachers. The problems in this phase of industrial education have been reviewed and basic assumptions restated. An adequate amount of trade experience as a qualification for teaching has been emphasized, the advisability of providing ways and means for the upgrading of teachers in service has been stressed, and the need for a more careful selection and evaluation of subjects to be included in an industrial teacher-training program has been definitely pointed out.

13. In industrial arts there was a growing realization that the work and practice in the junior high school grades, for pupils making normal progress, should be organized in accordance with general education objectives. The form of organization which is proving very efficient for this type of instruction is the general shop. For the past four or five years general shops in the public schools have increased rapidly. The indication is that the increase is more rapid now than at any time in the past. For the more mature and overage pupils in the elementary grades, some schools have provided through special classes shopwork of a more specific and more practical character.

14. The practice of the past two years has shown an increasing tendency for public schools to accept responsibility for guidance and to assume it as one of the objectives of educational training. Both States and city school systems have devoted considerable attention to the development of materials bearing upon guidance, to the organization of programs, and to the procedure for carrying the programs into effect. Vocational guidance still occupies the prominent place in the thinking of most people and receives the major emphasis in most guidance programs. This is due to the fact that it touches most immediately the end result of guidance, namely, placement in an occupational career. However, a complete guidance program will embrace more than vocational guidance and placement. It will be based upon a conception of guidance as broad as education itself, and include as objectives guidance for health, social adjustment, and personal habits.

15. There is an increased interest in the development of occupational information courses. Not only is there an increase in the number of schools offering such courses, but the content of the courses and the methods of instruction are both undergoing refinements which may be expected to result in greater value to pupils.