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BUREAU OF EDUCATION

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VOCATIONAL SECONDARY EDUCATION

PREPARED BY THE
COMMITTEE ON VOCATIONAL EDUCATION OF
THE NATIONAL EDUCATION ASSOCIATION

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INTRODUCTORY.

The preliminary report of the committee on vocational education, issued at the Salt Lake meeting of the National Education Association, 1913, gave an account of the appointment of a committee as the result of resolutions passed at the Chicago meeting of the association in 1912. This report contained a statement of what had been accomplished in the few months available before the July meeting. The most important feature of this report was a tentative outline which showed the scope and possibility of the work.

The first question considered by the committee was whether or not a real need existed for its services and whether or not the work planned was a legitimate part of the work of the National Education Association. To establish some definite conclusions regarding this question, an investigation was carried on by the committee by means of a questionnaire to a limited number of the active members of the National Education Association. This questionnaire, briefly setting up the fact of the appointment of the committee, was so arranged as to ascertain rather accurately the opinions of those to whom it was submitted as to the need and desirability of further activity by this committee. The large majority of affirmative answers in reply to this questionnaire seemed to indicate that there was a legitimate field in which positive work could be done.

The investigation was carried still further by a more extended questionnaire on the whole question of vocational education. This was submitted to about 500 members of the National Education Association, and replies were received from nearly one-half of those to whom it had been submitted. The general conclusion drawn from the replies was that there exists a real need for investigation, suggestion, and recommendation in this field, inasmuch as vocational education bears a very positive relation to public welfare. The complete results of this questionnaire were submitted to the National Education Association at its St. Paul meeting, 1914. At the same meeting in St. Paul there was published a proposed terminology prepared by a subcommittee of this committee, consisting of Dr. David Snedden, commissioner of education in Massachusetts, chairman; Mr. C. R. Allen, agent for the State Board of Education in Massachusetts, and the chairman of this committee. This ter-

minology did not attempt to settle the question of definitions; it rather prepared a tentative proposal which might enable persons interested in the introduction of vocational education to clarify their own thinking and their own statements in regard to the work. A revision of this terminology in the light of later criticisms is included in this report.

From time to time meetings of this committee have been held both in connection with the meetings of the National Education Association and in connection with the meetings of the National Society for the Promotion of Industrial Education. At these meetings in most cases a majority of the committee have been present, and it has been possible to consider somewhat carefully plans of work. As in all committee work, it has been necessary, however, for individuals to carry on specific investigations and to make rather definite reports of such investigations.[1] Much of the matter submitted has been referred to persons not members of the committee, and has been revised in view of such suggestions and reactions as have been made by them. It has not been possible to submit each individual document to each individual member of this committee; hence, in the presentation of the following report it should be borne in mind that the specific chapters have been prepared, not by the committee as a whole, but by individual members of the committee or by persons selected by this committee. In planning the work for this volume it was first thought that the whole field should be covered. The extended outline prepared as the first report of the committee, however, was so comprehensive that for practical purposes it seemed utterly impossible to prepare a volume which should contain all the points mentioned. In short, it would appear that there is a growing conviction that the field of vocational education is so replete with possibilities that it is quite necessary that continuous work be carried on both in the field of survey and accomplishment and in the field of suggested forward movement.

In the plans made for the preparation of this volume the idea was presented that it should be prepared for the assistance of those seeking to introduce vocational education into any given community. Through conference it developed that in all probability the superintendents of schools in the several communities throughout the country would be the persons most likely to be interested in the introduction of this type of education. For that reason the objective was to prepare a report which would be of assistance to the average superintendent of schools in a community of ordinary size, were he

[1] The material for the following chapters was, in the first instance, assembled by the persons here named: Chapters I and II, by Robert J. Fuller; Chapters III and IX, by David Snedden; Chapters IV and V, by Charles Prosser; Chapter VI, by C. H. Winslow; Chapter VII, by Meyer Bloomfield; Chapter VIII, by A. Lincoln Filene; and the appendix by E. B. Snyder.

to feel the need of introducing such work into his home school system. With this limitation the committee set to work to prepare its report. Among the things felt to be especially necessary were a brief historic setting of the work in vocational education, some knowledge of the kinds of schools that have been established in this country, and where these schools may be found, a knowledge of the terms and definitions which seem to be desirable in the work of vocational education for purposes of clearness, a knowledge of how to investigate the need for the work in any given community, a knowledge of how to carry it on after investigation has been made, some reference to the relation between vocational education and vocational guidance, the proper methods of financing the problem, and a statement of possible problems and difficulties which have not been settled and which require further consideration previous to their settlement.

The committee which was appointed by the president of the National Education Association at the meeting of the department of superintendence in February, 1913, consisted of educators, social workers, labor representatives, and business men. The widely representative character of the committee was planned for in the original resolutions, passed at the Chicago meeting in 1912. As at present constituted the committee is made up of the following persons:

Robert J. Fuller, chairman, superintendent of schools, North Attleboro, Mass.

David Snedden, State commissioner of education, Boston, Mass.

Arthur D. Dean, chief of the division of industrial education, State of New York.

R. W. Himelich, principal Normal Training School, Cleveland, Ohio.

Charles H. Winslow, director of surveys, Indianapolis, Ind.

Frank Duffy, general secretary United Brotherhood of Carpenters and Joiners, Indianapolis, Ind.

W. B. Prescott,[1] formerly commissioner of International Typographical Union on Supplemental Trade Education, Chicago.

A. Lincoln Filene, treasurer and general manager of William Filene's Sons' Co., Boston, Mass.

Walter D. Sayle, president Cleveland Punch & Shear Works, Cleveland, Ohio.

Miss Julia Lathrop, Chief Children's Bureau, Washington, D. C.

Owen P. Lovejoy, secretary National Child Labor Committee, New York.

Charles A. Prosser, president Dunwoody Institute, Minneapolis, Minn.

[1] Deceased.

VOCATIONAL SECONDARY EDUCATION.

Chapter I.

HISTORY AND DEVELOPMENT.

The present use of the term "vocation" in the field of education is somewhat more comprehensive than the generally accepted idea of the word. Its earlier adaptation was more particularly to the "callings" or professions. It is almost within the present decade that its fuller meaning has been interpreted. This newer significance has not yet become sufficiently well and widely known to have the educational doctrines which it now includes generally appreciated either by educators or laymen.

In tracing the development of the doctrine of vocational secondary[1] education, it is recognized that, in the earlier American life, handwork of all types was done in the home. It was here that the operator, obliged to know the whole process, turned out small quantities of manufactured articles. Even the young people who were to enter the professions were, for the most part, taught some of the home occupations. The points of contact were so numerous that differentiation was impossible. Whatever of direct instruction for a vocation was to be given was handed from father to son and from mother to daughter. This was not unlike the earlier practices in the European countries. With the increased population and the increased needs in America, it became necessary to produce in still larger quantities. Very naturally, then, did the people of this country turn to the experience of Europe. It was there that the apprenticeship systems, which existed somewhat among the Greeks and Romans and which were most pronounced during the Middle Ages, had become so highly systematized under the guilds. This influence assisted much in the introduction of the apprenticeship system in the United States.

Like the home shop the apprentice shop was soon forced to abandon its plan because of the increasing demands of society. The

[1] The word "secondary" in these discussions is used to limit the field. This committee had to do particularly with a consideration of education of less than college grade for persons 14 to 18 years of age. This automatically excludes the professional schools, higher technical schools, etc., as well as elementary schools.

adjustments required a long series of intervening steps until industry, unable to produce goods in sufficient quantities, profiting again by European experience, adopted the plan for division of labor. This plan necessitated the employment of a certain number of persons highly skilled in several processes of a trade and of a much larger number of persons skilled to the degree of specialization in a single process.

This evolution of industry which took place, not alone in America, but in the European countries as well, although less rapidly, resulted in a more limited supply of skilled workers. This latter fact made it doubly difficult in America, for, on the one hand, her own trained workers decreased in numbers and, on the other hand, the importation of such workers was lessened. Furthermore, many of the workers themselves had been forced for one cause or another to enter industry at an early age. They were obliged to specialize, as in the shoe industry, from cutters and last makers to inspectors of the finished product. They finally found themselves unable and unfit either to advance, to secure a more lucrative position, or to increase their output materially. Dissatisfaction, insufficient training, a lessened quality as well as quantity of work produced, and unrest were the result. This situation forced upon the manufacturer the necessity of a source of supply of labor and at the same time forced upon many of the workers the necessity of securing some form of instruction or type of work which would enable them in later years to increase their earning capacity.

So far as can be determined, the American manufacturer at the time of the Centennial Exposition at Philadelphia sensed for the first time the fact that abundant resources alone were insufficient to enable him to compete in the European markets with European goods or in the home market against these same goods. It was here that the American producer had his first opportunity to compare the products and workmanship in his own factory or shop with those of foreign producers. It is an historic fact that schools for art in industry were soon established in several manufacturing centers. Thus was the way opened for manual training, which was started in several of the larger centers before the expiration of another decade.

The lay public who had been educated under the theory of abundant mind training through the faculties were ready to accept the plan. They believed that through it would be derived a practical education, using practical in the sense of earning a livelihood. The more conservative were convinced of its value when it was explained that concentration, coordination of hand and brain, etc., would result. It required many years of experimentation to show

the fallacy of the reasoning that hand training in general, however skillfully organized in successive steps, and however carefully correlated with intellectual attainment, would actually function in any specific occupation unrelated to the work previously performed.

It required the initiative of a man of large affairs, a man of industry, to inaugurate a movement to supply this deficiency. The governor of Massachusetts recommended to the legislature of 1905 an investigation and report upon the needs for industrial education in that State. A commission was appointed. Its report brought about drastic legislation, setting up in the first place an independent State body whose duty was to promote the interests of industrial education in the State. Additional legislation made possible the introduction of industrial education in a given locality with State aid on a graduating scale from 20 per cent to 50 per cent of actual expenditure for maintenance.

Other legislation of a positive nature followed. A commission was appointed the following year in Wisconsin. As a result of its report the Wisconsin Legislature adopted plans for vocational education in 1907 and 1911. New York established laws for vocational education in 1908.

The following diagram has been prepared after careful study of the statutes of the several States. In many cases it has been somewhat difficult to determine whether or not vocational secondary education was permissible in any given State. This is all the more difficult in view of the fact that it is known to members of the committee that in some of the States in which there seem to be no laws providing specifically for vocational education certain types of vocational secondary education are being carried on at local public expense. In preparing this diagram, however, it was assumed that the statutes were a statement of fact and prima facie evidence that vocational secondary education was not legally recognized by the State in question.

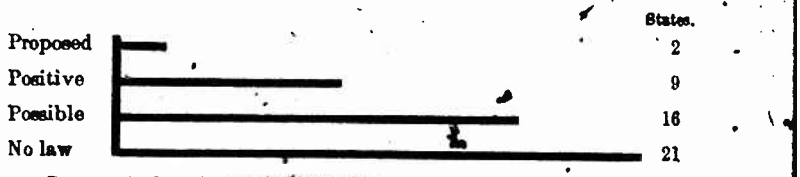


DIAGRAM h—Laws for vocational secondary education, distribution by States.

According to the diagram [1] there are 2 States at the present time in which it is proposed to pass laws bearing directly upon vocational

[1] The States included in each of these classifications have been listed and will be furnished upon request to the Bureau of Education or to the committee.

secondary education; there are 9 States which have already passed laws aimed directly toward the introduction of vocational secondary education; there are 16 States in which under the present statutes, so far as can be ascertained from the statutes themselves, it would be possible to introduce some form of vocational secondary education; there are 21 States in which it would appear that there are no statutes having any direct reference to the introduction of vocational secondary education. In fact in these States it may be seriously questioned whether or not vocational secondary education could be introduced without a modification of the statutes.[1]

Since 1908, as shown in the diagram, 7 other States have passed laws which have a direct bearing upon the question of industrial education.[2] As a result, in most of these laws the State subsidizes the local community in carrying forward the work, provided the local authorities conform to certain rather definite requirements. Several other States have asked the National Society for the Promotion of Industrial Education to suggest legislation. As this bulletin goes to press there is a strong probability that Federal aid to vocational education will be granted by Congress. Hence it will be seen that within one decade the United States Government and a considerable number of the States of the Union have taken active measures toward introducing ways and means to provide additional education for those persons over 14 years of age who must of necessity enter some trade or enter industry.

That this demand for a type of education which shall correspond somewhat to life's activities is more than a mere whim is borne out by the extent of legislation already passed concerning manual training and household arts. In nearly every State these subjects are recognized as a legitimate part of public education. In by far the greater majority of these States work in both subjects is carried on in the schools. Despite the fact that in several of the States in which these subjects were introduced there is a feeling that they often fail to function in the lives of the pupils, the number continues to increase. In some of these States, however, this partial failure to reach the desired end has brought about commissions and laws looking toward a type of education which shall train for a specific purpose, that purpose to be easily recognized by the student and his parents.

Even the work in agricultural education, which has been fostered by the United States Government for many years, seemed to lack somewhat the necessary qualities to make it actually efficacious in

[1] Mr. John A. Lapp, of Indiana, who has made a study of the constitutions of the several States, has found that in some cases at least it will be necessary to amend the constitution of the State before vocational secondary education can be introduced.

[2] See Appendix for digest of these laws.

producing boys who can farm. The courses in this subject in many of the high schools were often purely textbook courses given in the abstract with practically no relation between the classroom work and the boy's job at home. Many times a modification of this textbook course resulted in so-called laboratory courses in agriculture which went little beyond the analysis of a few types of soil and the suggestion as to possible crops which might be propagated thereon. Boys on the farm were very rightly dissatisfied with this type of education, consequently many of them left their homes to gain a higher education which might be secured at some college. Those of them who had sufficient vision to see the possibilities of farm life often went, to be sure, to the agricultural colleges which have done effective work for a considerable number of years; others with less vision felt that the professional pursuits were more advantageous to them from an intellectual and social as well as a financial standpoint. The parents of these boys gradually found that their farms were being deprived of the more intelligent among the youth of their community. Consequently, dissatisfaction with this sort of thing became quite prevalent. Very naturally, then, in certain communities there was a willingness to provide a type of agricultural education, even, which should actually train a boy to do real farm work.

Instruction for the girls in these rural communities was even less satisfactory than that for the boys. They were all taught the common-school branches, with a little algebra, possibly some geometry, and, if the community was large enough, a little Latin and one modern language—subjects no one of which was designated to assist them in making themselves better homemakers or give them in large numbers a broader outlook upon the possibilities of home life, industrial life, or agricultural life in general.

In those communities where domestic-science courses were offered, the training was general and had no particular bearing upon the lives of the girls in their own homes. In many communities the appropriation was too meager to make this work actually meet conditions of the home. It is only within a very few years that definite projects have been set up for girls in rural communities which are interesting and which involve their ordinary daily activities. At the present time, however, the improved opportunities in the rural communities are having a wide influence upon this work in the country at large.

It would appear, then, from the foregoing facts and conditions that vocational education has not been a mere passing fancy or a project of an individual mind; it has had a definite and rather positive growth until, whether educators or laymen wish it or not, certain definite types of vocational education will be demanded by the fathers and mothers of the boys and girls in the

schools for the direct purpose of fitting these boys and girls to take their right place in life. As has been previously stated, already several States have undertaken the solution of this problem through legislation. It may be possible that such legislation is only tentative; it must of necessity be subject to constant revision and constant amendment. Nevertheless, the fact remains that these States at least recognize the need for this particular type of education in order to provide an equal opportunity for all.

Chapter II.

TYPES OF VOCATIONAL SECONDARY SCHOOLS.

A directory of secondary vocational schools now in operation in the several States is printed on pages 22–32 of this bulletin. It was compiled after a careful and detailed analysis of the several types of vocational schools. This analysis included also the industrial arts, commercial arts, practical arts, and technical schools, as well as the vocational schools. The following is the analysis as sent to each individual school, including the detailed description of each type of school which accompanies it.

NATIONAL EDUCATION ASSOCIATION.

COMMITTEE UPON VOCATIONAL EDUCATION AND VOCATIONAL GUIDANCE.

R. J. Fuller, Chairman, North Attleborough, Mass.

You are asked to fill in the name of your school as indicated. In order that we may know how to classify your school in our list, you are also asked to check in the following list the type which your particular school comes nearest to fitting.[1] Kindly return this sheet to the committee at your earliest convenience.

ANALYSIS OF TYPES OF VOCATIONAL SCHOOLS IN THE UNITED STATES.

A. Agricultural Schools.
- I. Vocational agricultural day school.
  - (*a*) Part-time agricultural school.
- II. Practical arts agricultural school.
- III. Farm extension school.

B. Commercial Schools.
- I. Vocational commercial day school.
  - (*a*) Part-time commercial school.
- II. Commercial arts school.
- III. Evening commercial school.
  - (*a*) Vocational commercial evening school.
  - (*b*) Commercial arts evening school.

C. Industrial Schools.
- I. Vocational industrial day school.
  - (*a*) Vocational part-time industrial school.
- II. Evening industrial school.
  - (*a*) Vocational extension industrial school.
  - (*b*) Vocational preparatory industrial school.
- III. Industrial arts school.

[1] See booklet for complete statement of this analysis.

C. Industrial Schools—Continued.
IV. Continuation industrial school.
(a) Extension industrial continuation school.
(b) Preparatory industrial continuation school.
D. Homemaking Schools.
I. Vocational ...omemaking day school.
(a) Part-time homemaking school.
II. Evening homemaking school.
(a) Vocational extension homemaking school.
(b) Vocational preparatory homemaking school.
III. Household arts school.
E. Technical High School.

*Town or City*_____*State*_____
*Date*_____*Name of School*_____
*Where located*_____*Street.*
*Answered by*_____

ANALYSIS OF TYPES OF VOCATIONAL SCHOOLS IN THE UNITED STATES.

This analysis is based, as nearly as possible, both upon actual practice and general terms which are being used in the various parts of the country to distinguish between the several types of education involved.

You are asked to classify your particular school in accordance with this plan. In case none of the descriptions seem to fit your individual conditions, kindly make your own classification, telling us where in your opinion it should be placed in this scheme.

A. AGRICULTURAL SCHOOLS.

Agricultural schools are those schools in which the teaching of some form of agriculture is made the prominent feature:

I. **Vocational Agricultural Day School.** Vocational agricultural day school is one in which the instruction is given in the daytime and under the real conditions of farm life. That is to say, the student must actually perform work upon land, or with stock or fruit, which work is productive and will teach him the actual operations involved.

These schools may be high schools devoting their entire time to agricultural education in this definite way, or to a study about the operations involved in the school time. This type of education may also be conducted as a department in a high school having other departments, such as preparatory courses, etc.

(a) Part-Time Agricultural School. Part-time agricultural education will be that form of education in which the pupil attends school one-half of the time, or thereabouts, and actually performs work upon farm projects the remaining portion of his time. His experience on the farm must be real productive experience.

II. **Practical Arts Agricultural School.** In these schools the work in agriculture will be of much more general nature than will that in the preceding schools. Under this head should be classified schools which offer work in home gardens or school gardens, which offer courses from agriculture textbooks without actual practical farm experience, and those which offer courses for the development of appreciation and interest in farming, or agriculture in general.

III. **Farm-Extension School.** It is known that farm-extension courses are provided through revenue from the United States Government in practically all

of the States in the country. Such courses are offered for the benefit of persons now engaged in farm work and are not confined to age limitations. This committee desires to know if such work is carried on in the communities receiving this questionnaire.[1]

B. COMMERCIAL SCHOOLS.

Commercial schools are those schools in which the teaching of bookkeeping, stenography and typewriting, salesmanship, buying, filing, and general office practice are the controlling courses taught in the school.

I. **Vocational Commercial Day School.** In this type of school there will be offered either a two or four year course in such subjects as are indicated in the preceding description. So far as may be possible the real conditions of trade will be duplicated. The entire instruction will be carried on in the school. These schools may be conducted in some cases as a part of the four-year commercial course so-called in some high schools. When so conducted, a positive distinction should be made between the work which is of a general character and is often offered during the first two years of the course, and that work which is of a more specific character and is offered for the purpose of training the students to become workers in the commercial field.

These schools may be known as commercial high schools devoting their entire time to commercial education or, as indicated above, they may form a part of the regularly conducted high school as a single department in that school.

(*a*) Part-Time Commercial School. Part-time commercial education is no doubt conducted in some communities. It is that form of education in which the pupil attends school a portion of the time and actually performs work in an office for the remaining portion of his time. The work carried on in the schools should be closely related to the work which is being carried on in the office. The office experiences must be real experiences and sufficiently varied to give the pupil an idea of general office practice.

II. **Commercial-Arts School.** In these schools the work in the commercial branches will be of a more general nature than that in the preceding schools. In addition to the work in the commercial subjects, there will in all probability be offered work in the general subjects of the school curriculum. In some instances, instead of real problems which the student is likely to meet in life, he will be studying general textbooks about commercial work and the way in which that work is carried on.

These courses or schools may be organized for the purpose of enabling the pupil to test out his own interest or desire for work of this nature. The courses may also be offered for certain pupils who desire to add to their general education the specific accomplishment of ability to use stenography or the typewriter.

III. **Evening Commercial Schools.** These schools may also be of the two types already described.

(*a*) Vocational Evening Schools. Those known as the vocational evening schools in which the entire emphasis is placed upon the acquisition of some specific form of commercial work, as the use of typewriting and stenography.

(*b*) Commercial-Arts Evening School. The commercial-arts course in the evening school in which n general acquaintance with commercial subjects is all that is expected to be accomplished by the course.

[1] It is not known to this committee that evening courses in agriculture exist in any part of the country. If they do exist, they should be classified either as practical-arts or farm-extension courses. Kindly classify any which you may have in this particular way.

C. INDUSTRIAL SCHOOLS.

Industrial schools are those schools in which the teaching of some trade, or parts of trades, constitutes the work of the schools. These schools may include such work as carpentry, mining, and training of teamsters, printers, barbers, etc.

I. **Vocational Industrial Day School.** The vocational industrial day school is one in which the instruction is given in the daytime. So far as possible the actual conditions of the shop are duplicated. The product made is marketable. The student performs work which is productive at the same time that he is learning the operations involved.

These schools may be of the nature of high schools which devote their entire time to instruction in trades. They may give both what might be called elementary instruction in the vocation, admitting pupils at [illegible] years of age, or they may give advanced instruction, admitting pupils at 16 years of age. The control of the instruction in these schools, whether the work is done in school or shop, is directly in the hands of the school.

(*a*) Part-Time Vocational Industrial Schools will be those schools in which a considerable portion of the time, nearly one-half, is given to the instruction in the school itself, and the other one-half to the earning of wages in a shop.

In this type of school usually there is a definite effort to make the school responsible to a considerable extent for the shopwork, although the responsibility may be equally divided. For this classification, however, these facts need not be considered.

II. **Evening Industrial School.** The evening industrial school will be a school in which the instruction in the trade or occupation is carried on in the evening. The work in the school may consist either of the short unit course or of the progressive course of instruction. In these schools there will be usually admitted only those persons who are actually engaged in the industry for which the instruction is given.

(*a*) Vocational Extension Industrial School. In case the instruction is in a field corresponding to that in which the person is engaged, the school will be called an Extension Industrial School.

(*b*) In case the work in the school is different from that in which the student is employed, and is for the purpose of giving him a new trade, the school may be called a Preparatory Industrial School.

III. **Industrial Arts School.** In these schools work closely allied to the industries—that is to say the trades and occupations—will be given. There will not be any direct attempt to teach a vocation through the instruction given. The thought that will underlie the work is to provide the pupil with experience, which experience will enable him to know something of certain occupations, and which may result in enabling him to choose wisely for his own vocation. They do not offer specialized courses of work. They are sometimes known as Pre-Vocational Schools. Another object which may underlie these schools will be the development of appreciation and interest in certain specified industries.

IV. **Continuation Industrial School.** Continuation industrial schools are those schools made up, for the most part, of students who spend the greater portion of their time in the industry, but who are obliged up to the age of 18 years to attend school a few hours per week (in no case less than four hours). Like the evening industrial school, they may be separated into two types:

(*a*) Extension Industrial Continuation Schools, in which the instruction in the school is about the work which the student is doing in the daytime, or is closely related to that work

(*b*) Preparatory Idustrial Continuation Schools, in which the pupil takes subjects entirely foreign to those related to his everyday experiences and learns a new trade or occupation.

D. HOMEMAKING SCHOOLS.

Homemaking schools are those schools in which the activities of the home are actually taught. They may include cooking, sewing, millinery, and the like.

I. **Vocational Homemaking Day School.** In these schools the greater portion of the work will bear directly upon the occupation of the home. The school may be conducted as a separate girls' school, or it may be conducted as a department in a high school.

(*a*) Part-Time Homemaking School. Part-time instruction in these schools will consist of a study of the subject of homemaking in the school and the actual practice of homemaking in the home.[1]

II. **Vocational Evening Homemaking School.** As in the case of other evening schools, evening homemaking schools will be carried on for the purpose of giving definite instruction in homemaking. The work in these schools may consist of short-unit courses or of progressive courses of instruction. Into these schools will be admitted those persons, usually women, who wish to become proficient in homemaking.

(*a*) In case the studeuts in the schools are employed during their working hours in occupations other than homemaking, such as clerks or stenographers, the school may be called a Preparatory Homemaking School.

III. **Household Arts School.** The work in these schools will be given for the purpose of enabling the students to become acquainted with the various activities found in the home. The aim of the course will tend to be somewhat general rather than specific. The thought that will underlie the work will be to furnish the student with an actual experience. This experience will serve as a basis for choice of vocation and may be of considerable value in the actual work of homemaking.

Usually these schools will not be organized apart from the ordinary high school, but will be single courses in these schools. They may be considered as prevocational in the sense that the work and instruction will be more inclined to be general than specific. The courses offered in the various schools will be designated as courses in domestic economy, domestic science, household arts, and the like.

E. TECHNICAL HIGH SCHOOLS.

Technical High School. These schools are the schools which were organized largely as a result of the movement for manual training in the schools. They offer general courses in machine working, woodworking, and other forms of manual work. The academic work is also somewhat closely related to the work carried on in the shops. In most cases and more particularly in the first two years of these schools, the academic work is general rather than specific. There would probably be very little direct effort to teach specific occupations. These schools sometimes may be said to prepare pupils for the higher technical schools and for courses in engineering in these higher technical schools.

[1] These schools may also serve the purpose of training bakers and that class of workers whose occupations may be said to relate closely to that of homemaking.

LOCATION OF VOCATIONAL SCHOOLS.

The following tables were made directly from the replies to the questionnaire which was sent to the State departments and to the individual schools. In other words, as far as possible, each school listed in the accompanying tables has been placed there by the authority of some person directly in charge of the school. This has prevented the committee from arbitrarily setting up and listing, or attempting to determine, the exact type to which a school belonged.

The data are as accurate as could be made from the material available. There is no thought of making the tables inclusive or absolutely correct. Any omissions that may have occurred have resulted from: First, failure to reply to the questionnaire; second, some schools already in operation may not have been known to the committee; and third, in the progress of the movement new schools are continually being established. Obviously it has been impossible to include in this list all of the commercial arts schools, household arts schools, industrial arts schools, technical high schools, as well as departments of these various types which are carried on quite generally in the United States. These schools have been purposely omitted, because this book is devoted mainly to the interests of vocational education, and it is generally recognized that schools of this type can not be classed as vocational schools.

It should be mentioned also that some omissions are due to the fact that State departments of education were unaware that certain types of vocational schools were in operation in the communities within their own States; nor is this a result of negligence, as many such schools are maintained wholly by local taxation and are carried on under local management. In some cases also States reporting, because of an insufficient amount of funds at their disposal, have been unable to make accurate investigations or to prepare sufficient data to provide statistics for specific types of education. For these reasons it is almost sure to follow that a vocational school true to some of the types indicated in this analysis may have been carried on for a considerable period without the full recognition of those who have been attempting to determine just where vocational education is at its greatest development. In other instances schools which have been doing successful work as vocational schools, but which are conducted under a separate foundation or as semiprivate institutions, have not been considered as within the province of the work of this committee. It is clear, therefore, that more of the several types of schools exist than are here recorded, and the officers of such schools should communicate with this committee, providing the necessary data for classification if they wish consideration in

future lists. In case it seems unwise for the committee to continue this form of investigation and report, the data will be turned over to the United States Bureau of Education or some other ogranization prepared to carry on this investigation permanently.

In the preparation of these lists no effort has been made to give the exact location of the school beyond the town or city and State in which it is situated. Any other method would add materially to the length of the tables and to the cumbersomeness of the report.

Location of vocational schools.

Cities and villages.	Agricultural.				Commercial.					Industrial.							Homemaking.						
	Vocational agricultural.				Vocational commercial.			Evening commercial.		Vocational industrial.		Evening industrial.			Continuation industrial.		Vocational homemaking.		Evening homemaking.				
	Day.	Part time.	Practical arts agricultural.	Farm extension.	Day.	Part time.	Commercial arts.	Vocational.	Commercial arts.	Day.	Part time.	Extension.	Preparatory.	Industrial arts.	Extension.	Preparatory.	Day.	Part time.	Extension.	Preparatory.	Household arts.	Technical high school.
CALIFORNIA.																							
Los Angeles	×				×	×		×		×	×	×	×	×				×	×	×		×	
San Francisco					×	×	×	×			×										×	×	
COLORADO.																							
Denver								×	×			×	×	×					×	×	×	×	
CONNECTICUT.																							
Bridgeport										×	×												
New Haven						×				×		×	×		×	×	×		×	×	×	×	
FLORIDA.																							
St. Augustine							×																
ILLINOIS.																							
Chicago					×				×	×	×			×			×				×	×	
INDIANA.																							
Anderson												×											
Brasil																		×					
Crawfordsville																			×	×			
Brookville																		×					
Carlisle																		×	×	×			
Columbia City																							
Evansville												×					×		×	×			
Fort Wayne										×		×					×		×	×			
Greencastle																			×				
Hammond												×											

Indianapolis
Muncie
Peoryville
Richmond
Salem
South Bend
Terre Haute
Worthington
IOWA.
Des Moines
Dubuque
KANSAS.
Leavenworth
MASSACHUSETTS.
Ashfield
Attleboro
Beverly
Boston
Brimfield
Bristol County
Cambridge
Chicopee
Clinton
Concord
Easton
Essex County
Everett
Fall River
Hadley
Harwich
Holyoke
Lawrence
Lowell
Marlboro
Methuen
Natick
New Bedford
Newton
Northampton
North Attleboro
Peterham
Quincy
Somerville
Springfield
Sutton
Taunton
Wakefield
Walpole

Location of vocational schools—Continued.

Cities and villages.	Agricultural.				Commercial.					Industrial.							Homemaking.					
	Vocational agricultural.		Practical arts agricultural.	Farm extension.	Vocational commercial.		Commercial arts.	Evening commercial.		Vocational industrial.		Evening industrial.		Industrial arts.	Continuation industrial.		Vocational homemaking.		Evening homemaking.		Household arts.	Technical high school.
	Day.	Part time.			Day.	Part time.		Vocational.	Commercial arts.	Day.	Part time.	Extension.	Preparatory.		Extension.	Preparatory.	Day.	Part time.	Extension.	Preparatory.		
MASSACHUSETTS—continued.																						
Watertown																						
Westfield										XX			X							X		
Worcester										X			X							X		
MICHIGAN.																						
Detroit					X	X		X				X			2							X
Muskegon																						X
MINNESOTA.																						
Minneapolis										X	X	X	X	X	X	X						
MISSOURI.																						
Ozark			X																			
NEW HAMPSHIRE.																						
Berlin							X							X							X	
Colebrook			X				XX														XXX	
Concord							XXX														XXXX	X
Keene							XX							XX							XXXX	
Lebanon														XXX							XXX	
Portsmouth							X							XX							X	
NEW JERSEY.																						
Atlantic County																						
Atlantic City							X		X	X				X			X				X	
Egg Harbor City														XX								
Hammonton							X							XX								
Pleasantville																						
Atlantic County vocational school	X	X		X																		

Bergen County:
Bergenfield
Carlstadt
Cliffside Park
Cresskill
Dumont
East Rutherford
Edgewater
Englewood
Fairview Borough
Garfield
Hasbrouck Heights
New Barbadoes
Oradell
Park Ridge
Ramsey
Ridgefield Park
Ridgewood
Rutherford
Tenafly
Union Township
Camden County:
Camden
Collingswood
Haddonfield
Merchantville
Pennsauken Township
Cape May County:
Cape May City
Ocean City
Wildwood
Cumberland County:
Bridgeton
Lawrence Township
Millville
Essex County:
Belleville
Bloomfield
Caldwell
Cedar Grove Township
East Orange
Glen Ridge
Millburn
Montclair
Newark
Nutley
Orange
South Orange
Verona
West Orange
Essex County vocational school

Location of vocational schools—Continued.

Cities and villages.	Agricultural.				Commercial.					Industrial.						Homemaking.					
	Vocational agricultural.		Practical arts agricultural.	Farm extension.	Vocational commercial.		Commercial arts.	Evening commercial.		Vocational industrial.		Evening industrial.		Industrial arts.	Continuation industrial.		Vocational homemaking.		Evening homemaking.		Household arts.	Technical high school.
	Day.	Part time.			Day.	Part time.		Vocational.	Commercial arts.	Day.	Part time.	Extension.	Preparatory.		Extension.	Preparatory.	Day.	Part time.	Extension.	Preparatory.		
NEW JERSEY—continued.																					
Gloucester County:																					
Franklin Township														×							
Glassboro							×							×						×	
Pitman														×						×	
Swedesboro							×							×							
Woodbury							×							×						×	
Hudson County:																					
Bayonne							×			×		×							×		
Hoboken							×			×		×	×	×			×		×	×	
Jersey City							×			×		×	×	×			×		×	×	
Kearny							×							×						×	
Town of Union							×							×						×	
Weehawken														×							
West Hoboken														×						×	
West New York							×							×						×	
Mercer County:																					
Ewing Township														×							
Hamilton																					
Princeton														×							
Trenton							×							×						×	
Middlesex County:							×							×						×	
Carteret														×							
Dunellen														×							
Highland Park														×							
Jamesburg							×							×							
Metuchen							×							×							
Milltown														×							
New Brunswick							×							×							
Perth Amboy							×							×							
Roosevelt Borough														×						×	
South Amboy							×							×						×	

South Brunswick
South River
Woodbridge
Middlesex County vocational school
Monmouth County:
Asbury Park
Atlantic Highlands
Belmar
Freehold
Long Branch
Manasquan
Middletown Township
Red Bank
Sea Bright
Morris County:
Boonton
Butler
Dover
Hanover Township (Morris Plains)
Madison
Mendham Borough
Mendham Township
Morristown
Morris Township
Riverdale (Pequannock Township)
Ocean County:
Lakewood
Point Pleasant
Passaic County:
Little Falls
Passaic City
Paterson
Pompton Township
Salem County:
Norma
Pittsgrove
Salem City
Somerset County:
Bernardsville
Bound Brook
North Plainfield
Somerville
Sussex County:
Franklin Furnace
Hamburg
Newton
Union County:
Cranford
Elizabeth
Linden

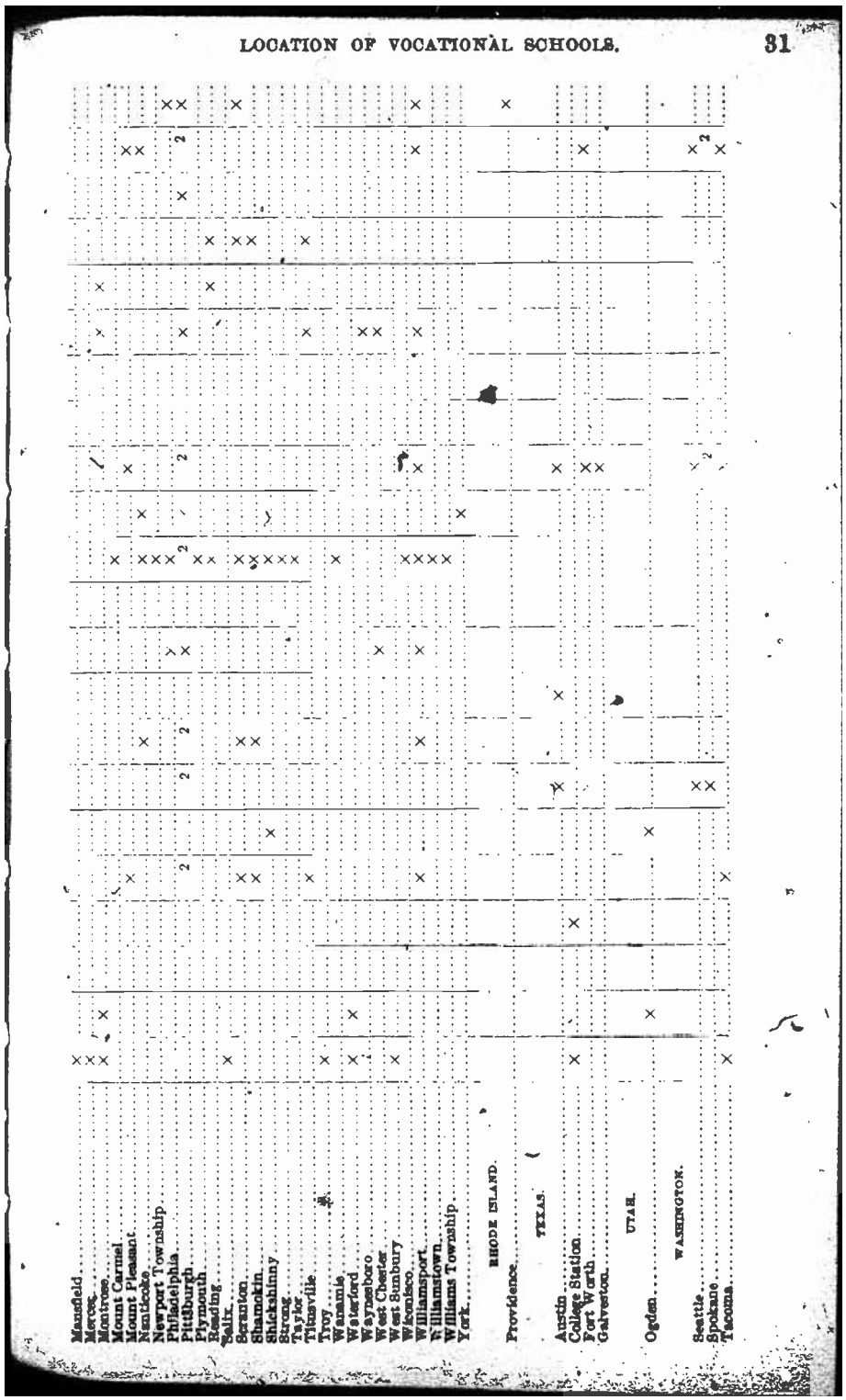
Location of vocational schools—Continued.

Cities and villages.	Agricultural.				Commercial.					Industrial.							Homemaking.						Technical high school.
	Vocational agricultural.		Practical arts agricultural.	Farm extension.	Vocational commercial.		Commercial arts.	Evening commercial.		Vocational industrial.		Evening industrial.		Industrial arts.	Continuation industrial.		Vocational homemaking.		Evening homemaking.		Household arts.	
	Day.	Part time.			Day.	Part time.		Vocational.	Commercial arts.	Day.	Part time.	Extension.	Preparatory.		Extension.	Preparatory.	Day.	Part time.	Extension.	Preparatory.		
NEW JERSEY—continued.																							
Plainfield							×							×									
Rahway							××							××						×			
Roselle							××							××						××			
Roselle Park														×××						×××			
Springfield							×							××						×			
Summit														××						××			
Township of Hillside							×							××						×			
Union Township														××									
Westfield							×							××						×			
Warren County:																							
Phillipsburg							××							××									
Washington							××							×									
NEW MEXICO.																							
Hope			×	×																			
Raton							×			×				×									
NEW YORK.																							
Albany																							
Albion	×									×		×					×		×				
Alden	×		×				×																
Au Sable Forks	×																						
Bethel	×																×		×	×			
Bellville	×																						
Brooklyn																							
Brushton	×											×											
Buffalo			×		2			3	2	5	1	10	3	4	2		3		19	3	2	2	
Canandaigua	×				×					×							×						
Cherry Valley	×																						
De Ruyter	×																						

East Syracuse										×											×	
Ellisburg	×																					
Elmira										×		×					×		×	×		
Gloversville					×					×												
Gowanda	×																×				×	
Greene	×																×				×	
Greigsville	×			×													×					
Hamburg	×																×				×	
Hammondsport	×																					
Hannibal		×																×				
Herkimer					×					×							×					
Highland		×																×				
Interlaken	×																					
Ithaca					×				×			×					×		×		×	
Jamestown							×	×						×			×					
Jordan			×																			
Lansingburg							×		×					×			×				×	
Le Roy	×				×												×					
Liberty			×				×															
Little Valley	×																					
Long Island City					×	×		×		×	×						×	×	×		×	×
Lowville			×	×			×														×	
Mexico	×																					
Millbrook	×																×					
Monticello	×				×												×					
Moravia			×																		×	
Mount Vernon					×							×		×			×		×		×	
Newark Valley	×																					
New York City										3		3	2		×							
North Tarrytown							×			×							×					
Olean										×												
Painted Post																					×	
Perry	×																					
Prattsburg	×																					
Red Creek	×																					
Rochester										3			3				×		×	×		
Schenectady								×	×			×	×						×	×	×	×
Sinclairville	×																×					
Solvay					×		×		×	×		×		×			×		×	×	×	
Spencerport	×																					
Stamford	×																×					
Syracuse																						×
Troy					×	×				×							×					
Utica														3							3	
Walton			×				×										×					
Waterford										×							×					
Wellsville										×							×					
Worcester	×																					
Wyoming	×																					
Yonkers												×	×				×					

Location of vocational schools—Continued.

Cities and villages.	Agricultural.				Commercial.					Industrial.							Homemaking.					
	Vocational agricultural.				Vocational commercial.			Evening commercial.		Vocational industrial.		Evening industrial.			Continuation industrial.		Vocational homemaking.		Evening homemaking.			
	Day.	Part time.	Practical arts agricultural.	Farm extension.	Day.	Part time.	Commercial arts.	Vocational.	Commercial arts.	Day.	Part time.	Extension.	Preparatory.	Industrial arts.	Extension.	Preparatory.	Day.	Part time.	Extension.	Preparatory.	Household arts.	Technical high school.
NORTH DAKOTA.																						
Beach			×	×																		
Bismarck							×							×							×	
Carrington	×																					
Ellendale														×							×	
Fargo			×	×										×							×	
Grafton			×				×			×				×			×	×			×	×
La Moure			×											×							×	
Valba	×				×												×					
Wahpeton										×							×					
OHIO.																						
Cleveland			×	×	×		×	×		×		×		×			×		×			
OKLAHOMA.																						
Oklahoma City					×	×								×			×	×				
PENNSYLVANIA.																						
Altoona										×		×							×		×	
Cambridge Springs	×																					
Easton																		×	×			
Elders Ridge	×																×					
Ellsworth												×						×	×			
Erie												×							×			
Hazleton																			×			
Homestead	×				×													×	×			
Johnstown												×	×						×			
Lampeter Township	×																					
Locust Gap												×										
Lykens												×										


Mansfield
Meroe
Montrose
Mount Carmel
Mount Pleasant
Nanticoke
Newport Township
Philadelphia
Pittsburgh
Plymouth
Reading
Selin
Scranton
Shamokin
Shickshinny
Strong
Taylor
Tidaville
Troy
Wanamie
Waterford
Waynesboro
West Chester
West Sunbury
Wyalusing
Williamsport
Williamstown
Williams Township
York
RHODE ISLAND.
Providence
TEXAS.
Austin
College Station
Fort Worth
Galveston
UTAH.
Ogden
WASHINGTON.
Seattle
Spokane
Tacoma

Location of vocational schools—Continued.

Cities and villages.	Agricultural.				Commercial.					Industrial.							Homemaking.					
	Vocational agricultural.		Practical arts agricultural.	Farm extension.	Vocational commercial.		Commercial arts.	Evening commercial.		Vocational industrial.		Evening industrial.		Industrial arts.	Continuation industrial.		Vocational homemaking.		Evening homemaking.		Household arts.	Technical high school.
	Day.	Part time.			Day.	Part time.		Vocational.	Commercial arts.	Day.	Part time.	Extension.	Preparatory.		Extension.	Preparatory.	Day.	Part time.	Extension.	Preparatory.		
WISCONSIN.																						
Appleton							×							×	×	×			×		×	
Beaver Dam					×											×		×	×			×
Beloit									×						×	×		×				
Chippewa Falls					×	×				×	×			×	×	×	×	×	×			
Cudahy					×	×								×	×	×						
Eau Claire					×	×	×							×	×	×						
Fond du Lac					×		×							×	×	×						
Grand Rapids							×							×	×	×						
Green Bay							×							×	×	×						
Janesville							×							×	×	×						
Kenosha							×							×	×	×						
La Crosse							×							×	×	×						
Madison							×							×	×	×						
Manitowoc						×									×	×						
Marinette									×			×			×	×						
Marshfield												×			×	×						
Menomonie							×	×							×	×						
Menosha							×					×										
Milwaukee							×			×	×	×	×	×	×	×						
Neenah							×	×				×	×		×	×						
Oshkosh							×	×						×	×	×						
Racine					×		×	×	×					×	×	×						
Sheboygan					×		×	×	×					×	×	×						
South Milwaukee											×				×	×						
Stevens Point							×							×	×	×						
Superior						×	×	×	×					×	×	×						
Two Rivers					×		×	×	×					×	×	×						
Wausau							×	×	×					×	×	×						
West Allis																						

SCHOOLS CLASSIFIED.

In general there may be said to be developing in the several States definite types of schools which hitherto have not been recognized in this country in the previous growth of education. For ordinary purposes these schools may be classified into three distinct types:

1. **Day Vocational Schools**, in which the pupils attend school the greater part of the working day for at least five days each week. In these schools are taught both the actual operations and the theory underlying these operations. These schools may again be classified according to (*a*) the place where instruction is given, and (*b*) the type of responsibility. If all of the work is carried on under one roof, the school may be a unified, full-responsibility, or part-responsibility school. The specific designation will depend upon the amount of responsibility assumed or conceded to the school officials. These schools again may be dual schools, that is to say, part of the work may be done in the school building and a part carried on in the shop, with a possible change in responsibility.

2. **Evening Vocational Schools**, in which, as the name implies, the instruction in the school is given in the evening. It may be given in the same operation or in some operation connected with the occupation in which the pupil is employed in the daytime, but in which he wishes further instruction to increase his efficiency. On the other hand, it may be in some occupation which the student wishes to enter, which differs materially from his regular daily work.

As indicated in the previously given analysis, schools for the first type of students are trade extension schools and for the latter, trade preparatory schools.

3. **Continuation Schools**, which, as generally carried on in this country, are schools in which the pupil receives some form of day school instruction at the same time that he is employed in the shop. Like the evening schools, the work in these schools may be preparatory or extension. In addition, it is possible in these schools to offer work for general improvement or culture.

The school at Beverly, Mass., furnishes one of the best examples of the day vocational, full-responsibility school. In this school the pupils receive theoretic or related instruction under the direction of their foreman during one week; and during the following week, under the direction of the same foreman, they receive definite instruction in the shops of the United Shoe Machinery Co. The instructor or foreman employed by the city is at all times responsible directly to the school authorities and has entire charge of the work of the group of pupils with whom he is associated.

The school at Quincy, Mass., carried on in connection with the Fore River Ship Building Co., is illustrative of the dual-responsi-

bility type of school, for the related instruction is given under the direction of the school authorities, while the technical or mechanical instruction is given under the management of the Fore River Ship Building Co.

Extension schools exist in many parts of the country, more particularly in the large cities. The evening schools in Boston devoted to homemaking and the metal trades and to the training of vocational teachers are excellent examples of these schools. While in some of these schools in some parts of the country is offered more work of a preparatory nature, in the sense used previously, it is yet to be demonstrated that any evening school can prepare students effectively for work in an unfamiliar occupation.

Probably the most notable example of the continuation school in a broad sense in this country is the system now carried on in Wisconsin. This type of school, however, has been in operation in Cincinnati for several years. More recently has it been inaugurated in Boston, where the director has charge of the vocational work in the city in general. Thus far the work here seems to be of an unusually high order. In all schools of this type there is an attempt to continue the education of the youth considerably beyond the age of 14 years. Some of these schools attempt to give trade extension and others trade preparatory work, but in general it may be said that continuation schools usually better illustrate improvement and general education schools than vocational schools. As in the case of the evening school, it does not seem to be clearly established that trades and occupations can be taught with a few hours' attendance upon school each week.

The best illustration of the part-time school is the one at Cincinnati in the university under Dr. Schneider. In this school the boys work one-half time in a manufacturing plant and attend school one-half time. This school, however, is of college grade, higher than secondary. The school at Fitchburg, Mass., is an example of the secondary school of this same type. Various experiments have been carried on in part-time education in other towns and cities, with varying degrees of success.

In any attempt to describe or classify vocational schools briefly, it is recognized that opinions as to the classification may differ. The attempt in the previous analysis has been only to set up a few of the larger types which represent rather definite procedure in the conduct of the schools. The classification here made is, so far as was possible, a direct analysis from the information available. It is to be expected that the work and method of organization in any of the schools mentioned may undergo continuous change. Hence, schools which have formerly been considered general schools may gradually grow into some definite type of vocational school.

Chapter III.

DEFINITIONS, ANALYSIS, AND ILLUSTRATIVE EXAMPLES.

PRELIMINARY.

Education is still largely in the "prescientific" stages of its development. As a consequence, it derives its terms and symbols almost exclusively from the everyday vernacular of the people. But the terminology thus developed necessarily lacks in definiteness and consistency. No two speakers on a given subject will be found to use terms derived from the popular language in exactly the same sense. Great confusion and waste of effort thus result.

The time has not yet arrived for educators to do what has been done in the fields of medicine, engineering, scientific agriculture, and other fields of applied science—that is, develop a technical terminology consisting of new terms and symbols coined for the purpose, and giving exact and unvarying meanings. In education it will be necessary for some time to continue to use, in the main, the old familiar words and phrases, with their numerous variations of meaning and their almost unlimited special connotations.

But educators can do this: They can agree to use certain words and phrases for the time being in certain definite ways, and with certain consistent meanings, and when making departures from this usage clearly indicate the grounds and extent of their divergence from the meaning agreed upon.

To this end there is required a series of definitions of the terms most frequently employed in education, and furthermore, such an extended analysis, with abundance of concrete illustration, as will show to anyone acquainted with educational thought actually what is meant by the nomenclature thus established. Most persons find it difficult to translate abstract terms and phrases into concrete and definite meanings. It is obvious also that during any period of marked activity in the development of an educational movement, new and varied situations arise which interest laymen as well as schoolmen. The very rapidity of that growth often anticipates the development of a clearly defined theory of education or social economy. To assist somewhat in avoiding the confusion in thinking and language resulting from the above conditions, this chapter

has been prepared. The usual plan has been to follow and precede definitions with an extended analysis of the ideas involved, and to append numerous concrete illustrations of the types of vocational education referred to.

As noted in a preceding chapter the earlier developments of this type of education began in Massachusetts. Consequently, there has grown up in that State a considerable background of theory, practice, and experience which has necessitated the use of terms with rather clearly defined meanings. For this reason some of the suggestions as to the use of terms and meanings are based upon the usage there, more particularly by the board of education, which was required by law to supervise various forms of vocational education. This made it necessary to evolve, and use consistently, a somewhat definite terminology. Other terms and definitions have, however, been utilized in this terminology. The whole is to be regarded as an effort to overcome somewhat the tendency in one field of education to follow a loose, general, and sometimes almost meaningless terminology.

I. GENERAL DEFINITIONS AND DISTINCTIONS.

1 (Definition). **Vocational education** is any form of education, whether given in a school or elsewhere, the purpose of which is to fit an individual to pursue effectively a recognized profitable employment, whether pursued for wages or otherwise.

Webster's Dictionary defines vocation as follows: Destined or appropriate employment, calling, occupation, trade, business, profession.

Among the specific occupations for which vocational education may be given are the following: Physician, electrical engineer, teacher, bookkeeper, salesman, stenographer, machinist, plumber, bricklayer, printer, dressmaker, cook, weaver, gardener, florist, farmer, poultryman, homemaker, mother's assistant, domestic servant, sailor, fisherman. This list is capable of being added to indefinitely. There are, at least, some hundreds of different occupations for each of which specific vocational training is practicable.

(*a*) By "purpose" is here meant the purpose or aim which is held in view, and in conformity with which all steps are taken in arranging programs of instruction, selecting practical work, devising tests, etc. The aim is said to "control" the selection of the means and methods of instruction used in realizing the aim.

For example, if it is the purpose of given courses of training respectively to produce a machinist, a physician, and a printer, the requirements of these respective occupations will control in the choice of the materials and methods of instruction. In the vocational

course, as such, matter will not be included which does not have a clearly perceived relationship to efficiency in the vocation.

(*b*) The purposes which should control in a given program of vocational education obviously can only be found by studying the vocation itself for which training is to be given. On the basis of the results of this study, means and methods of training and instruction must be devised, and a predetermined degree of efficiency in the proposed calling constitutes the aim or objective, in the light of the demand of which the means and methods of such training and instruction are selected.

For example, the means and methods employed in the training of a printer may differ absolutely from those employed in the training of a house carpenter. What means (including thereunder subjects of study, courses of instruction, textbooks, material equipment, etc.) and methods (methods of teaching, class organization, adjustment of practical to technical work, etc.) shall be employed in each case will depend wholly upon the requirements of the occupation itself.

(*c*) The extent to which training can be given for a recognized vocation will, in the last analysis, also depend upon the inherited and acquired powers of the individual who is to be trained, and on the economic conditions determining the age at which the person enters upon the pursuit of a given occupation.

In common practice, only persons of exceptional native endowment and opportunities for prolonged study are admitted to classes preparing for the practice of medicine, engineering, teaching, etc. In every trade school, many applicants are refused, or are early eliminated, because of physical or other unfitness for the successful pursuit of the trade. A person obliged to become self-supporting at 14 or 15 years of age can not reasonably be expected to profit from the introductory stages of prolonged courses of instruction designed to require the time of a more favored student up to the age of 18 or 20.

(*d*) In practice, any program of vocational education should be based upon the requirements of a definitely analyzed calling, and the means and methods should be modified, so far as practicable, with a view to their adjustment to the needs and possibilities of a group of individuals having a common purpose, and possessed of somewhat similar qualifications.

(*e*) Vocational education of any specific kind "functions" when, as a result of a definite amount of training, an ascertainable degree of proficiency in the exercise of a vocation is shown in the individuals trained.

For example, if it can be shown that a given course of instruction (embracing practical training and theoretical instruction) in den-

tistry produces in most of those taking such course a definite ability successfully to practice dentistry, then such training is said to "function" effectively. Again, if in the case of a young man, already a successful worker in the machineshop calling, a definite series of short units of training in some form of mathematics or drawing adds obviously to his industrial ability, then such training is said to "function." If, on the other hand, 40 per cent or 50 per cent of the persons completing, for example, a course of study alleged to fit for farming are able to show no marked improvement in practice as a result of such training, or if an equal number, after having had such training, enter other callings, then the "functioning" of such instruction may be regarded as doubtful or imperfect.

2. **Major divisions of education of equal rank with vocational education.**—Other major divisions of education besides vocational education are: Physical education, social education, and cultural education. Physical education may be held to embrace all forms of training and instruction the controlling purposes of which are to conserve and promote useful development of the body and its capacity for effective "functioning." Social education may include all forms of training and instruction designed to make for better group living and activities. Included under this head are moral education, civic education, ethical training, and much of religious instruction. Cultural education may here include all forms of training and instruction designed to develop valuable cultural interests of an intellectual and æsthetic nature, including permanent interests in such fields as art, literature, science, and history. Cultural education also includes training in the use of intellectual "tools," or "instrumentalities" of general (not particular, i. e., vocational) application, such as the efficient use of the vernacular language in reading, writing, and speaking, a second language, etc. Social education and cultural education are often described jointly as "general" and in later stages as "liberal" education.

3. **Distinction between general and vocational education.**—General education aims to develop general intelligence, powers of appreciation in all common fields of utilization, and powers of execution with such intellectual instruments as language, mathematics, scientific method, etc., without reference to recognized or specific callings; while vocational education has its aims, and, therefore, its means and methods determined in any case by the requirements of a specific calling.

For example, experience proves that it is desirable for all persons to be trained to read and to write, without reference to the specific callings which they may ultimately pursue. Equally, all people should be trained to appreciate and to choose wisely for their own use valuable products from such fields of human effort as literature,

art, economic goods, and the specialized service of others. All persons should also be trained in the habitual actions, appreciations, knowledge, insight, and ideals, which constitute approved moral conduct and good citizenship. The forms of education designed to produce these ends may be further subdivided and described by such terms as "elementary education," "academic education," "general secondary education," etc.

4. Distinction between vocational and practical arts education.—Vocational education is also to be distinguished from various forms of so-called "practical education," which may resemble, in their processes, vocational education, but which do not result in definite forms of vocational efficiency.

The various forms of nonvocational education here comprised under the term "practical arts," include manual training, sloyd, manual arts, arts and crafts when pursued as part of general education, household arts, simple gardening and agricultural education, many phases of commercial education, etc.

(*a*) The various forms of practical arts education as now given in schools are not properly vocational, although sometimes mistaken for vocational education, because they do not result, except by chance, in recognized forms of vocational efficiency, nor are they assumed to be given to persons who have defined vocational aims. The means and methods they adopt are not selected with a view to the preparation of the pupil for recognized callings.

(*b*) Various forms of practical arts education have an important and valuable place in general or liberal education, as a means of enlarging general intelligence, developing sound appreciation of economic products, and in part in laying the foundations for vocational choice.

(*c*) Practical arts education is sometimes termed "prevocational education," because of the belief that a suitable program of practical arts training will make important contributions toward the individual's ability to choose a vocation wisely. Its value to this end depends largely upon the degree to which the individual has already developed vocational interest and a desire to choose a suitable vocation.

5. Distinction between direct (or systematic) vocational education and indirect vocational education.—A large amount of vocational education, in the broad sense of that term, especially for the unskilled or semiskilled occupations, is an indirect result or a by-product of association and cooperation with older people engaged in productive occupations. One is said to "pick up" skill, vocational intelligence, or vocational ideals in this way. Among primitive peoples usually, and even in civilized society in many fields, such as homemaking and farming, indirect

vocational education is common. There is a tendency in society to substitute systematic or direct vocational education for indirect (and therefore, presumably, uneconomic and ineffective) procedures.

6. **Distinction between systematic vocational education through schools and through other agencies.**—Vocational education may be carried on through a school (an agency specialized for this purpose) or through other agencies, primarily specialized for other and, usually, profit-making purposes, and only secondarily adapted to systematic vocational education. Apprenticeship in the trades, and, originally, in the professions, is an example of such nonschool systematic vocational education. Farmers and homemakers sometimes quite systematically train their children to follow their own vocations. Commercial establishments often provide for the definite instruction and advancement of young assistants. There is a manifest tendency on the part of society to transfer to school agencies vocational education, because of the greater degree of concentration and effectiveness thus made possible, and because, under modern conditions, economic agencies are unable to give due attention to systematic vocational education as a secondary phase of their responsibilities.

7. **Distinction between private and public vocational schools.**—Vocational schools may be supported by private agencies either through endowments or through fees received from students. Such schools, when controlled by private agencies, are called "private vocational schools." They may further be distinguished according as they are (*a*) endowed with more or less philanthropic intent, and having no object of profit in view; or (*b*) as being on a commercial basis in having profit making as a chief end. Public vocational schools are those supported, at least in part, under public expense, and are usually under the control of publicly constituted authorities. Professional schools in State universities, trade and commercial schools conducted by municipalities, agricultural and homemaking schools conducted by States or subdivisions thereof, etc., are examples of public vocational schools.

As a rule, professional schools in the United States have not been organized for profit. Many commercial, and some trade schools, are conducted for profit. Philanthropy has also endowed many trade schools for dependent or defective children.

II. MAJOR DIVISIONS OF VOCATIONAL EDUCATION.

1. **Major divisions of occupations.**—The economic or productive occupations (as distinguished from leisure and cultural occupations) which men and women follow (chiefly for self-support) may, for convenience, be grouped in six large classes, namely, the

professions, the agricultural pursuits, the commercial pursuits, trades and industries, homemaking pursuits, and nautical pursuits.

The major divisions of wage-earning occupations recognized by the United States census are: The professions, agriculture, domestic occupations, trade and transportation, and trades and manufacturing pursuits. The United States census does not recognize the division of nautical pursuits, nor does it include homemaking pursuits (because nonwage-earning) under the head of domestic occupations.

The United States census includes under trade and transportation (for commercial pursuits) railway workers, sailors, etc. Under the domestic occupations are included barbers, janitors, soldiers, watchmen, cooks, servants, hotel keepers, etc.

2. **Major divisions of vocational education.**—The suitable major divisions of vocational education, corresponding in the main, to those of the economic occupations, are these: Professional education, vocational commercial education, vocational agricultural education, vocational industrial education, vocational homemaking education, and nautical education.

It is advantageous to subdivide vocational education into the six divisions given above, because each division has its own distinctive pedagogical characteristics, based largely upon the phases of the occupation for which training is being given. It is clear, however, that in many cases a hard and fast classification will not be practicable. For example, cooking as a wage-earning occupation will be classed under the industries, whereas cooking as a part of home making will come properly under home-making education.

For other purposes, vocations may be grouped into (*a*) those requiring a relatively large amount of technical or abstract knowledge, such as the practice of medicine, law, teaching, engineering, and bookkeeping; and (*b*) those requiring or appearing to require a relatively large proportion of manual or other form of bodily skill, such as dentistry, machine-shop practice, dressmaking, and farming. In popular language, the distinction is made between "brain workers" and "hand workers." Also, it is important to make distinctions based on the suitable age at which workers can take up vocations (the so-called "age of efficient entrance into industry"). A person is rarely expected to take up responsible work in the practice of medicine before the age of 22 or 23; in engineering before the age of 20; and in teaching at least before the age of 18. Many trades can not be followed effectively until the worker has reached the age of 18, on account of the bodily strength required, or responsibility with machinery. Again, industrial vocations are frequently divided into the skilled and unskilled, to many of the former the word "trade" being applied.

(*a*) Because many forms of apparently practical education (i. e., training for productive pursuits), which are not in reality vocational (as defined above), are already designated by such terms as "commercial," "agricultural," "industrial," etc., it seems necessary that the term "vocational" should be included in each designation of a form of vocational education except the professional and nautical, as "vocational commercial education," "vocational agricultural education," etc.

(*b*) There is a sense in which the term "industrial" is also applied to many occupations lying outside of the trades and manufacturing pursuits, as when we speak of "industrial history," "industrial disturbances," "industrial and political development," etc. This usage has also been extended to the field of education, so that there is a popular sense in which "industrial education" means nearly every form of vocational education, except, perhaps, homemaking and professional education. This loose and indefinite usage should be discouraged.

3 (Definition). **Professional education** includes those forms of vocational education the direct purpose of each of which is to prepare individuals for the successful pursuit of a recognized profession.

Among the professions recognized by the United States census are: Law, medicine, engineering, journalism, theology, architecture, acting, dentistry, teaching, music, literature.

Nursing, leadership in agriculture, leadership in war, and leadership in institutional management should probably also be included among the professions.

(*a*) Vocational education for the professions, like vocational education for the trades, was formerly carried on through apprenticeship, but now schools of medicine, law, theology, and military leadership have entirely replaced apprenticeship as a means of systematic vocational education for these professions. Schools for these professions originated in some cases several centuries ago. Vocational schools of engineering and teaching were first founded early in the nineteenth century. Almost every profession (except nursing, acting, and, in a measure, journalism) now has numerous well-organized schools of vocational training. Conscious apprenticeship methods seem to survive only in training for nursing and, in a measure, acting and journalism.

(*b*) In some professions, such as medicine, law, and teaching, the State safeguards standards by means of certification or licensing. In these cases the requirements of such certification greatly affect standards of vocational school work. The practice of State certification is carried much further in European countries than in America.

(*c*) Certain studies found in schools or colleges, preliminary to the professional course, are now recognized as preparatory or "prevocational" to professional study. Examples of these are biology as prevocational to medicine; history and economics as prevocational to law; trigonometry and physics as prevocational to engineering; etc. It was formerly asserted that studies such as Latin and modern languages were prevocational to almost all of the professions. The validity of this contention is now disputed.

4 (Definition). **Vocational commercial education** includes those forms of vocational education the direct purpose of each of which is to fit for some recognized commercial calling.

Among the commercial callings enumerated by the United States census are those of agent, banker and broker, bookkeeper and accountant, clerk and copyist, commercial traveler, merchant and dealer (retail), merchant and dealer (wholesale), messenger and office boy, officials of banks and companies, packers and shippers, salesmen and saleswomen, stenographers and typewriters, telegraph and telephone operators, etc.

Most of the training for commercial pursuits is still obtained in and through the callings themselves. Schools for systematic vocational commercial training exist for only a few occupations, such as those of bookkeeping and accountancy, and stenography and typewriting. A few schools have also been founded to train salesmen and saleswomen, clerks, telegraph and telephone operators, etc.

(*a*) It is desirable that steps be taken to analyze and define the essential features of the various commercial occupations for purposes of adapting to each its appropriate vocational training. For examples, that there are two distinct forms of salesmanship, namely, counter or indoor salesmanship and field or traveling salesmanship. These require different school training.

(*b*) The term "commercial education" has also long been employed to designate courses of study dealing with specific phases of practice or knowledge applicable in, or derived from, the commercial callings. Such education has frequently been fostered as vocational education, although its actual outcome in vocational efficiency—that is, its positive vocational "functioning"—has not been demonstrated and is still in doubt. This has, perhaps, been particularly the case when these alleged vocational studies have been carried on in public high schools. The approach to them has usually been bookish and theoretical, and comparatively slight effort has been made to base either practice or intellectual study on the actual requirements of commercial callings.

The studies commonly employed in this capacity are accountancy, bookkeeping, commercial law, industrial history, history of com-

merce, business arithmetic, typewriting, stenography, business practice, etc.

(*c*) Much so-called "commercial education" in public and private schools doubtless has, or can be made to have, value as a part of liberal or general education designed to give young people some appreciation of, and insight into, the commercial occupations. Training and instruction of this character might also do much in directing young people toward efficient choice of commercial occupations and in giving vocational ideals.

(*d*) Unfortunately, no clearly defined line is yet drawn, especially in public schools, between commercial studies that are expected to "function" vocationally and those which are designed as part of a general or liberal education. This is a source of much misdirected effort, and probably many young people are permanently handicapped by the failure of schools to distinguish between these two objects.

5 (Definition). **Commercial education**, or preferably "**commercial arts education**," includes those studies derived from, or based upon, the commercial pursuits which are designed to give liberal or general education and to contribute to vocational guidance and vocational ideals in the field of the commercial occupations.

The term "commercial arts education" may seem somewhat forced in this connection, but there are good analogies in the departments of industrial arts education, agricultural arts education, and household arts education (which see).

6 (Definition). **Vocational agricultural education** includes those forms of vocational education the direct purpose of each of which is to prepare students for some one of the agricultural occupations.

Among agricultural occupations are those of agricultural laborer, dairyman, farmer or planter, gardener, florist or nurseryman, stock raiser, bee keeper, poultry keeper, etc.

Agricultural education of various kinds is now given in agricultural colleges. This includes much work of an essentially secondary grade (in extension classes, etc.), while a part of it is of a collegiate or professional level. A small number of agricultural secondary schools are also equipped to give actual vocational education toward agricultural pursuits.

Agricultural occupations being as yet less specialized than either professional or industrial occupations, agricultural education preserves a relatively general character. Much so-called "agricultural education" is still only quasi-vocational, because it does not give definite and actual preparation for agricultural vocations. But short lecture courses and demonstrations are valuable when offered

to experienced farmers, capable of carrying the knowledge thus acquired into practice, making it "function."

(*a*) The term "agricultural education" is also applied to various forms of agricultural study, frequently having as an alleged end vocational education in agriculture. As found in most schools, the studies embraced under agricultural education are usually bookish and theoretical. Their actual "functioning" in efficiency to pursue such callings as those of the farmer, gardener, florist, poultryman, stock raiser, etc., is often doubtful, but their contributions to general or liberal education may be important.

(*b*) Agricultural education, so called, as now carried on in many schools is, or can be made, a valuable factor in liberal or general education. Appropriate studies under this head can give appreciation of, and insight into, agricultural occupations and the importance of agriculture both as an economic pursuit and as a means of social development. Furthermore, the study of agriculture to this end may give important vocational guidance and lead to the establishment of vocational ideals. It can also be made a valuable means of illustrating applications of various forms of science. It can, therefore, be regarded as an important form of liberal education.

(*c*) In many cases school authorities seem as yet to make no clear-cut distinction between vocational agricultural education and agricultural instruction, which is actually nonvocational in its results, but may be made of importance in liberal education. As a consequence, effort in this direction is doubtless frequently misdirected.

7 (Definition). **Agricultural arts education** includes those forms of training and study based upon agricultural pursuits and designed to enhance general intelligence, to promote appreciation of agriculture as a form of economic activity, to show wherein various sciences have practical application to human affairs, and to give vocational guidance and to inspire vocational ideals as these relate to the field of agriculture. Agricultural arts education, therefore, constitutes an important division of liberal education, both in the elementary and the secondary field.

8 (Definition). **Vocational industrial education** includes those forms of vocational education the direct purpose of each of which is to fit the individual for some industrial pursuit or trade.

Among the trades and industrial pursuits enumerated by the United States census are those of the carpenter and joiner, mason (brick and stone), painter and varnisher, paper hanger, plasterer, plumber and steam-fitter, roofer and slater, oil-well worker, chemical worker, brick and tile maker, glassworker, marble and stone cutter, potter, fisherman, miner, baker, butcher, confectioner, miller, food packer, blacksmith, iron and steel worker, machinist, boiler maker, stove maker, toolmaker, wheelwright, wire worker, shoemaker, har-

ness maker, tanner, bottler, brewer, distiller, cabinetmaker, woodworker in general, brass worker, watchmaker, silver and gold worker, tinplate worker, bookbinder, box maker, engraver, paper-mill operative, printer, lithographer, dyer, cotton-mill operative, knitting-mill operative, silk-mill operative, woolen-mill operative, dressmaker, hat maker, milliner, seamstress, shirt maker, tailor, broom and brush maker, charcoal burner, steam engineer, fireman, photographer, tobacco operative, upholsterer.

(*a*) For many of the foregoing vocations no systematic vocational education at present exists, either in schools or under nonschool agencies.

Among the industrial occupations for which neither organized apprenticeship nor vocational schools as yet offer training are mill operatives (in general), food packers, box makers, general woodworkers, shoemakers (in factories), general iron and steel workers, etc.

(*b*) For a number of the foregoing occupations wherein skill is required, the chief form of training available at the present time is apprenticeship, of a more or less organized character.

The large majority of persons following such pursuits as those of carpenter, plasterer, plumber, stonecutter, machinist, etc., are still trained through the agency of apprenticeship.

(*c*) For some of the foregoing occupations, well-organized vocational schools (generally called trade schools), supported either privately or publicly, are available in various parts of the country, although the total number of workers trained by them constitutes, as yet, but a small proportion of those required by the industry.

Among the occupations for which definitely organized vocational schools, giving either complete training or partial training adjusted to the practice obtained in the industry, are these: Carpenter, house painter, plumber, machinist, bricklayer, cabinetmaker, patternmaker, sheet metal worker, bookbinder, sign painter, electrical worker, printer, dressmaker, milliner, etc.

In foreign countries well-organized day or part-time vocational schools are found also for such occupations as those of baker, butcher, weaver, cook, teamster, lithographer.

Some industries have organized special schools for such occupations as those of motorman, glove maker, photographer, linotype operator, telephone operator, confectioner, etc.

(*d*) The term "industrial education" is frequently applied to a variety of forms of practical, or apparently technical training, based upon operations characteristic of some industries.

Among the forms of so-called practical training to which the term industrial education is sometimes applied are manual training, sloyd,

mechanical drawing, technical training, mechanics arts training, printing, bookbinding, metal work, etc.

(*e*) Like commercial arts education, and agricultural arts education described above, the really valuable pursuit in "this industrial education" (which may properly be called "industrial arts" education) should be realized through the participation of the pupil in the practical phases of selected processes, as these may be found adapted to the pupil's experience, physical powers, etc. Practical participation in industrial arts processes can be supplemented by reading, visits to industrial establishments, experience in analyzing and assembling machines, etc., all of which may have as a controlling purpose the increasing of the pupil's general intelligence, the stimulation of his powers of wise utilization, the laying of foundations for vocational choice, and the interpreting of contemporary life. All these constitute valuable contributions to general education.

9 (Definition). **Industrial arts education** includes those forms of training and study based upon industrial pursuits and designed to enhance general intelligence and give vocational guidance in the field of industrial occupations.

(*a*) Reform schools for juvenile delinquents have been in the past, and are sometimes still, called "industrial schools." When these institutions ceased to be looked upon merely as prisons, or houses of refuge, public sentiment demanded that vocational training should be given in them, in view of the probable fact that neither the opportunities of apprenticeship nor of home vocational training would be available for these unfortunate youth. Hence, even 50 years ago a form of systematic vocational training was undertaken in reform schools. Probably only a small part of this training ever actually "functioned" in vocational power, because of wrong pedagogical methods employed.

10 (Definition). **Vocational homemaking education** includes those forms of vocational education the direct object of which is to fit for homemaking as practiced by the wife and mother in the home and also for some specialized forms as practiced by household employees, housekeepers, or other wage-earning assistants to the homemaker.

A large variety of more or less unspecialized activities are carried on in the home. These include the preparation of meals, laundering, house cleaning, garment making, garment repairing, the nursing of children, minor repair work in the equipment of the home, etc. In homes conducted on a somewhat elaborate scale, specialized forms of service may be found, the workers being housekeepers, cooks, waitresses, chambermaids, nurses, butlers, janitors, etc.

Among occupations which were formerly carried on in the home, but have been since specialized away from it, are those of spinning,

weaving, milking, butter and cheese making, tanning, barbering, brewing, food packing, shoemaking, furniture making, etc. Other occupations which now seem to be in process of being specialized away from the home are baking, garment making, fruit preserving, etc.

(*a*) As in the case of farming, there is comparatively little specific vocational differentiation within the average home. Notwithstanding the removal from the home of many specific forms of productive work, homemaking remains a distinctive and clearly defined vocation for the wife and mother living under normal family relations as well as for specialist workers in homes and institutions. It is ordinarily a composite vocation, utilizing various forms of skill and related knowledge. Vocational education for homemaking must, therefore, aim to produce as many forms of power as the distinctive home operations now require, each to a degree suited to the time, energy, and native ability of the learner. It is especially necessary that in the homemaker an harmonious union of various forms of skill and knowledge should be found.

(*b*) From 60 per cent to 80 per cent of all women eventually become homemakers. Modern social and economic conditions are such that the majority of these spend the years from substantially 16 to 20 or 25 in wage-earning pursuits (only a small proportion being connected with homes), after which homemaking is entered as a career to be followed for life, or at least for many years.

(*c*) During recent years, many forms of education have been introduced into private and public schools as designed to minister to the development of homemaking power or appreciation. These are variously named "household arts," "domestic science," "domestic arts," "household economics," "home economics," "domestic economy," etc. Frequently they have been introduced into schools as subjects of study and laboratory experiment on the same basis as other studies. The extent to which these studies "function" vocationally, if at all, for homemaking is yet in doubt, especially when they are followed only from two to five hours per week. In most instances it is probable that the training thus given should be rewarded as effective rather on the side of liberal than of vocational education.

(*d*) The study of household arts (with the aid of suitable textbooks, laboratory experimental work, etc.) can obviously be made a valuable feature of liberal education, in the sense that such study can improve standards of utilization and develop larger ideals of home life. Women exert an exceptionally large influence on standards of consumption in the fields of artistic products, economic utilities, and specialized service. For this reason, it is especially important that as a phase of their general education they should be instructed and trained as to most effective standards of utilization.

11 (Definition). **Household arts education** includes all those forms of instruction and training based upon the occupations of the home or household, and which are designed to promote higher standards of appreciation and utilization in the field of the activities associated with homemaking, to promote right conceptions of the social importance of the home as a nursery of childhood and a haven for the wage earners of the family, and to show wherein the various arts and sciences have practical application in domestic life. Hence, household arts education can be made a large factor in the liberal education of womanhood.

12 (Definition). **Nautical education** is the term used to designate those forms of vocational education, the controlling purpose of each of which is to train youths for such occupations as those of the fisherman, the sailor, the ship captain, and the like. These forms of training have not yet been clearly differentiated in the educational practice of America. A few special nautical schools of a technical character exist, and in the United States naval service facilities for training seamen are provided.

III. PEDAGOGICAL PHASES OF VOCATIONAL EDUCATION.

1. **Major and minor phases.**—Vocational education, as respects its organization for teaching purposes, presents in almost every instance two quite distinct major phases and one minor phase, namely, the concrete, practical, or manipulative major phase; the technical or theoretical major phase, the subjects of study under the latter head being sometimes referred to as the "related subjects"; and a third relatively minor phase embracing those studies and practices designed to promote vocational ideals, general insight, and other knowledge and appreciation which are pertinent, but not directly necessary for the particular vocation for which training is being given.

In the training of the dentist there is required: (*a*) Practical work in filling, etc.; (*b*) theoretical study of anatomy, etc.; and (*c*) possibly some study of the history of dentistry, of the practice of dentistry in other countries, of the need on the part of the dentist of offsetting the strains of his calling by suitable exercises for the sake of his own health, etc. In the training of the teacher there are required: (*a*) Practice in teaching; (*b*) the study, from the standpoint of the teacher, of the subjects which she will expect to teach, as well as methods of teaching, school hygiene, etc.; and (*c*) the history of educational administration, the lives of noted educators, etc. In the training of the machinist is required: (*a*) A large amount of practical manipulative work in constructing valuable objects from steel or iron; (*b*) study of such phases of mathematics, drawing,

mechanics, etc., as apply to the practice of the machinist; and (*f*) possibly some study of the history of the evolution of the iron and steel industries, of the distribution of these industries in various countries, of special hygiene for metal workers, etc.

(*a*) The foregoing are the phases of a program of systematic vocational education. It is recognized, of course, that a program of liberal or general education may be carried on side by side with a program of vocational education. A student might give half his day to vocational education and the other half to liberal education; or he might give one week to the one and another week to the other. A more common arrangement is to have the student give the best part of his working day to vocational education, with provision made for some cultural or civic studies, exercises, or participation, in marginal time. For example, the Massachusetts program permits from 10 per cent to 20 per cent of the day to be given to cultural training. This may be in English literature, music, or other lines of interest and importance.

(*b*) The problem of the proper combination of general with vocational education is one to be determined on the basis of aims and the requirements of efficient practice in each field, taking due account of the economic necessities of the learner. It is contended in some quarters that, if general or liberal education be blended with vocational, neither form becomes efficient. The question as to how far the two forms may be adjusted within a given day or other period efficiently must be determined by the experiment.

2 (Definition). **The concrete, practical, or manipulative phase** of vocational education in any occupational field includes all phases of learning through actual and direct participation in the practical processes characteristic of the vocation itself.

The following are examples: The prospective physician obtains concrete training through his hospital service, the teacher in his practice teaching, the engineer in actual field work, the journalist by serving as reporter, etc. Persons preparing for the commercial callings are expected to receive concrete or practical training through typewriting and stenography of a presumably practical nature made a part of the course of instruction through various types of exercises in salesmanship, the undertaking of practical work in accounting, etc. Manipulative or concrete work in agriculture as a means of training is provided through having the learners actually engage in the raising of crops, on a large or small scale, participation in harvesting, and other practical work during summers and vacations, the care of domestic animals as a part of the animal husbandry course, etc. In various forms of vocational industrial education, practical work is provided through having prospective machinists manufacture parts of the equipment of the school, through the manufacture

of salable products, etc.; prospective dressmakers spend a part of their time in making a salable product, etc. Practical or manipulative work in homemaking involves the preparation of meals, the actual making and repair of garments, the care of children, etc.

Concrete, practical, or manipulative work in vocational education may be (*a*) on a nonproductive or (*b*) on a productive basis. Productive manipulative work may involve no compensation to the student worker or regular compensation to him. In general, modern pedagogical theory favors productive work as against nonproductive work, where practicable. The distinction is this: Nonproductive work is not commercially profitable; when the popil is through, his product is laid aside or destroyed. Productive work is commercially profitable. Its results are used to increase the equipment of the school itself, to render service in the schools of the local community, or to be sold. Again, students who do productive work which is used in the school or sold may not be compensated for the same on the ground that it is their partial contribution toward the cost of their education, or they may receive a small wage for the same. Pedagogical theory favors the latter plan, where practicable, because of the greater interest evoked and because the environment produced is similar to that in which the pupil will later follow his vocation.

3 (Definition). **Productive practical work** includes all forms of practical work as a part of vocational education, the material results of which are of evident value to society.

The services of internes in hospitals, of prospective teachers in training schools, of boys doing their productive work on a home farm, of shopworkers in city schools doing repair work on school buildings, of homemaking pupils taking charge of the preparation of meals for schools, etc., all represent forms of productive practical work.

4 (Definition). **Nonproductive practical work** includes all practical work as a part of vocational training the output of which can be put into no practical use.

Examples: Business college students keeping books, doing typewriting, etc., of a nonmarketable character; agricultural school students raising products which are not marketed or consumed; engineering students making extensive surveys the results of which are of no commercial value; shop students constructing articles that are simply kept for exhibit or destroyed, etc.

(*a*) Vocational education in the past was carried on largely in shops, and through other commercial vocational agencies, under a more or less organized system of apprenticeship. The pupil learned almost exclusively through actual participation in concrete work. His tasks were sometimes graduated as to difficulty, either by chance or design. The pupil learned mainly through imitation, his superior

sometimes showing him the "tricks" and various devices. Vocational education under apprenticeship is usually more effective on its practical than on its technical side.

Many examples still survive of learning through apprenticeship. A locomotive engineer obtains his training first as a fireman. A nurse frequently obtains all of her training through actual nursing in a hospital. Until very recently, many teachers in England obtained their training solely as apprentices, being known as "pupil teachers." In many skilled trades, organized apprenticeship still survives, in one form or another. Leadership in many vocational fields is reached through promotion from the lower stages—essentially a method of learning through actual participation which is without the direction characteristic of apprenticeship.

(*b*) Because recognition of the value of actual participation in concrete work took place early in the development of vocational education in schools, endeavors have frequently been made to employ substitutes for participation in the actual processes themselves where participation in the commercial occupations is difficult or impracticable. This may be called practical work on an "exercise" basis.

The following are examples: The law student practices in a moot court. The engineering student carries on surveys around the campus. Commercial schools devise imitation money, set up receiving windows, etc., and carry on "make-believe" business having some semblance to actual business. The agricultural student is given small plats on which to raise plants, or he shares in a form of "group" or "gang" labor directed by some teacher. The wood-working student is given exercises on lathes and other machines, the products of such exercises having no commercial value.

(*c*) Several problems are still unsolved as regards concrete work in many lines of vocational training. Can commercially practical work be presented in properly graduated stages? What shall be the unit, or project, in the practical work? Can practical work in a school take the place at all of practical work under commercial conditions apart from the school? Is it economically desirable that the practical work of a school be sold in open market? Shall the pupil be compensated for his practical work? How shall the practical work be related to necessary technical training? How far shall the student be permitted to subdivide his practical work in the direction of becoming a specialist, as in machine-shop working, textile working, etc.?

5 (Definition). **Apprenticeship** is a term here used to include all forms of systematic vocational education through the participation of the learner, under the direction of skilled workers, in the actual work of various productive occupations.

Well-known examples are the apprenticeship arrangements in the various skilled trades. Other examples, not always included under the term, are the "pupil-teacher system," formerly prevalent in England, the training of nurses in hospital practice, the training of commercial experts in commercial houses through systematic advancement from one type of employment to another, the methods employed in the middle ages of training knights and priests, the methods formerly prevalent by which physicians, lawyers, etc., first took service as youths under older practitioners, etc.

Apprenticeship as a means of vocational education is generally believed by students to be declining in possibilities and importance. It has almost disappeared in all the professions except nursing, acting, and journalism. In the industries the substitution of manufacturing processes for crafts production, and the subdivision of work made possible, has greatly diminished the field for apprenticeship training. In occupations calling for increased amounts of technical knowledge (various electrical trades, plumbing, gardening, etc.) the methods of apprenticeship prove unequal to the task of giving, in satisfactory form, technical instruction. Evening vocational schools were first organized to compensate for this deficiency.

6 (Definition). **Technical, theoretical, or "related subject" phases of vocational education** include those readings, lectures, and studies and exercises in mathematics, science, drawing and art, laboratory exercises, etc., which furnish organized knowledge of, and practical insight into, the so-called "technical aspects" of vocations. The technical studies appropriate to any vocation can only be determined by a study of the requirements of that vocation itself.

The following are examples of the technical knowledge required in certain vocations: For the physician, physiology, special phases of chemistry, materia medica, etc.; for the electrical engineer, certain phases of applied mathematics, drawing, the principles of electricity, some of the principles of mechanics, etc.; for the farmer, agricultural science, embodying selected phases of botany, soil physics, chemistry of fertilizers, hygiene of domestic animals, meteorology, accounting, exchange forms of mechanics as applied in farm machines, etc.; for the bookkeeper, some phases of mathematics; for the house carpenter, certain phases of drawing, mechanics, building materials, and mathematical calculations; for a teamster, local geography, mechanics of vehicles, hygiene of domestic animals, etc.; for the dressmaker, certain phases of art, drawing, mechanics, etc.; for the homemaker, specific phases of food chemistry, decorative art, simple forms of mechanism, etc.

(*a*) With regard to the great majority of vocations, no satisfactory analysis has yet been made of the related technical studies which are

pertinent and valuable. But it has become evident that the content of technical training which actually functions in many vocations is much less than has been assumed. The inherited traditions of academic education have caused many people to believe that all of the phases or parts under a given inclusive subject should be studied, notwithstanding the absurdities to which this contention leads. For example, botany and chemistry as separate abstract subjects are sometimes taught in agricultural schools; prospective mechanics are induced to study algebra and geometry; and a prospective house carpenter is urged to take a general course in mechanical drawing, although, in each case, the successful workers in these fields will employ only very limited and special phases of these subjects. It is obvious that progress in the development of programs of vocational education will involve a clear differentiation of the technical training needed in each vocation. Experience will probably show that so-called "foundations" in general knowledge of abstract scientific, or mathematical, or art subjects, is often relatively valueless for vocational purposes.

(*b*) In some discussions of vocational education the related technical studies are sometimes called the "academic subjects." This usage is confusing, and should be discouraged. The word "academic" should be restricted to the field of general, or liberal, education.

7 (Definition). **A technical school** is a school designed to give technical knowledge only, as that is involved in some recognized vocation or group of related vocations.

The following are examples: Schools of law and medicine originally taught only the more theoretical phases of these professions. Only in the more recent stages of their development are they introducing practical work as a means of instruction. Schools of engineering originally taught chiefly engineering mathematics, drawing, science, etc., giving little or no practical work. Some schools of technology still confine themselves to this; but in many others shop-work, summer-camp work, compulsory practical service in mines, etc., are now added, to give necessary practical experience. The earlier agricultural colleges and schools taught primarily the mathematics and sciences supposed to constitute a basis of knowledge for agricultural practice. Some commercial schools offer only informational studies regarding commercial operations. Technical high schools teach chiefly certain phases of applied science and art, illustrated with laboratory practice. Much of the home making taught in contemporary high and other schools, under such heads as "household arts," "domestic economy," "household economics," etc., is primarily an attempt to give technical knowledge only of the processes involved in home making.

(*a*) Technical education had its origin and took its shape primarily through the attempts of society to supplement apprenticeship as a means of vocational training, the apprenticeship giving practical experience, but not related technical knowledge. Evening vocational schools, as well as day schools, came into existence, first, to give related technical knowledge.

The first medical colleges, as well as other professional schools, in many instances assumed that the student had already served an apprenticeship as an assistant to a practitioner.

(*b*) The value of technical education when administered without connection with practical training must be considered solely with reference to its actual efficiency in contributing to a complete scheme of vocational education. In some of the higher fields, as engineering, technical knowledge alone may constitute a very valuable foundation, whereas, in many of the trades, it may, if unaccompanied by practical experience, be almost valueless. The entire matter is one requiring further scientific study.

(*c*) Secondary technical schools as now found in the industrial, agricultural, and commercial fields can only occasionally be called "vocational schools" in the sense used here, because the instruction in them is not adjusted to the requirements of a distinctive vocation. Commonly their teaching is of a general nature, unrelated to the actual requirements of callings as now organized. It is probable that their teaching does not generally "function" in direct vocational power. In a few cases the effects of the training given may be vocational, as in the case of draftsmen and analytical chemists.

(*d*) Technical schools sometimes offer studies the actual value of which may consist in the establishing ideals and appreciations. A normal school, for example, may offer the history of education, which is not properly a technical study, but the study of which may give rise to ideals of teaching. Such a study properly belongs under the head of "General vocational studies."

8 (Definition). **General vocational studies** are those which, when considered with reference to a particular calling, seem to lead to the development of ideals, general interest, and social insight, but without contributing to specific forms of useful knowledge, skill, or power.

The following are examples: The physician may study the history of medicine or the hospital practices of the past, or he may read the biographies of such men as Jenner, Pasteur, and Lister. The engineer may study economics and the rise of modern industry, labor problems, and geological science. The teacher may study general psychology and the history of education. The prospective machinist may study the general literature of his subject, the history of the evolution of steel working, industrial hygiene as related to his call-

ing, etc. The prospective clerk may study commercial geography, the history of exchange, and modern banking problems. The prospective home maker may read of the homes of the past or of the present in other lands, etc.

(*a*) It is obvious that in and about any particular calling a large amount of literature may be gathered which, properly used, should do much to promote ideals, to give insight into the social relationships of the calling, to develop an appreciation of its hygienic and psychological aspects, and to lay the foundations for an appreciation of the possibilities of advancement for the worker.

(*b*) The actual value of so-called general vocational education is still open to question. It is exceedingly easy to organize and administer various forms of "general vocational" education in accordance with academic traditions. It may lead to "industrial intelligence," a quality which, if it exists as ordinarily conceived, is much in demand. It is probable that the actual value of general vocational education is very dependent upon the degree to which it has been preceded by foundations in practical experience and definitely related technical studies.

IV. PEDAGOGICAL DEVICES IN VOCATIONAL EDUCATION.

Vocational education requires the development of new and sometimes unfamiliar pedagogical devices, most important of which, for the present, are those signified by the terms "projects," "short unit course," "correlation of technical and practical training," and "productive work."

1 (Definition). **A project** in vocational education is a definite unit of instruction which combines practical or manipulative achievement with a definite enhancement of power to apply related technical knowledge.

(*a*) Practical work alone may correspond to what is known as a "job" in many lines of industry. A project is an "educational" job; it has educational value, and it ought to have economic value.

(*b*) Growth in capacity to apply related technical knowledge may involve application of general knowledge already obtained, as where a student in carpentry learns to make further use of his previously acquired knowledge of board measure; or it may involve the acquisition of new technical knowledge, as that is immediately related to the job in hand.

(*c*) A complete project usually involves the following steps on the part of the learner:

1. Purposeful consideration of the conditions to be met in undertaking the job.
2. Planning how to meet these conditions, in terms of the materials of the trade, trade operations, suitable tools, etc.

3. Preparation of needed preliminary working aids in conventional forms, such as drawings, working plans, etc.
4. The performing of such calculations as may be necessary, including figuring cost, ascertaining amount of stock to be used, and other conditions.
5. The execution of the job as planned, and in accordance with specifications.
6. The submission of a proper report of the job.
7. In some cases, a disposal of the project on an economic basis.

The following are examples of projects: An engineering student employed to lay out a grade as required by a railroad; a hospital interne given charge of a case; a teacher taking full charge of a group of pupils; an agricultural student undertaking to raise an acre of corn, and to market the same, or to take charge of two dairy cows for a year, including the proper care, feeding, and milking of these; an industrial-school student undertaking a definite job of work as this is carried on in commercial enterprises; a pupil in a trade school making a dress, or a group of pupils in a school of carpentry erecting a cottage; a student in homemaking preparing the family breakfast for a month, etc.

(*d*) Projects may be subdivided into major and minor projects, the latter being subdivisions of major projects.

For example, a boy in an agricultural school might undertake to raise an acre of potatoes, this being his major project. For practical purposes, he would subdivide this into a series of minor projects, each one a unit in itself. A class of pupils in an industrial school might undertake the construction of a machine, each boy having some one piece of work assigned to him as his minor project, or even some one operation. A girl undertaking the preparation of the family breakfasts for a month might make her minor project temporarily the study and practice required in preparation of one dish.

(*e*) It is obvious that projects may be individual or cooperative. It is conceivable that in industrial schools, large cooperative projects might be undertaken by a class, with appropriate subdivisions, each subdivision forming a project by itself.

(*f*) The project has no definite counterpart in academic or general education. Much of the work in general education was formerly organized on the "lesson unit" basis. In such subjects as mathematics, history, geography, English, it is now organized on the "topic unit" basis. The study of a classic selection in a foreign language, and the execution of a manual training enterprise provide the nearest analogies.

(*g*) The alternative to the project organization of vocational work is, on the one hand, the job as the unit of practical work, and,

on the other, the logically organized course of instruction in technical subjects.

(*h*) In many lines of vocational education, satisfactory series of projects have not yet been developed. Obviously, the development of a project system of organizing vocational work presents very great difficulties, and especially to persons prepossessed in favor of the logical organization of technical subject matter.

2 (Definition). **The short unit course** is an intensive form of training and instruction which is intended to meet, in a limited number of lessons, a specific need of a particular group of learners. Each unit deals with some one teachable phase of a trade or other occupation, and is complete in itself.

The short unit course has thus far been worked out primarily only in the fields of agricultural, industrial, and homemaking education. In agriculture, short unit courses are found in connection with extension work, where, in the course of a week or a few weeks definite instruction is given in both the manipulative and technical phases of some one specific field of practice in agriculture or animal husbandry. In evening industrial schools the short unit course is designed to give quite specific instruction, either of a manipulative or technical character, in some one phase of the trade or occupation being followed, or to be followed. It is assumed that the short unit course, when technical in character, will be related to the practical work already being followed by the learner.

The following are examples: Five lessons in the use of spraying; 5 lessons in orchard cropping; 5 lessons in farm accounting; 5 lessons in grafting; 10 lessons in kiln drying of lumber; 10 lessons in the use of the buzz planer; 5 lessons in the use of the sliding rule; 6 lessons in thread cutting; 20 lessons in cotton sampling; 5 lessons in the making of a shirt waist.

3 (Definition). **The correlation of technical studies and practical work** includes such pedagogical devices as involve the integral relation of technical studies with jobs of practical work as found in the project method of organization.

The following are examples: Mechanical drawing may be taught as a general subject, apart from its particular application to the work of the machinist, house carpenter, or dressmaker (probably general, or general technical, rather than vocational); or, as opposed to this, it may be taught in intimate correlation with the practical work of training for various specific vocations. A pupil studying house carpentry may acquire power in mechanical drawing through exercises closely adjusted to the practical work which he is taking from day to day. Different forms of drawing would therefore be required for the machinist, the plumber, the electrician, etc.

Such sciences as botany and zoology may be studied by a prospective farmer, independent of their particular applications in agriculture (therefore general education). As opposed to this, the student of agriculture may undertake to raise an acre of potatoes, and in conjunction with this problem study those phases of plant and animal life which are essential to the success of his enterprise.

A girl may study the mechanical principles of movement of air currents as a matter of physics (general). As opposed to this, she may be instructed in the practical problems of making various types of stoves burn effectively, and in conjunction with this problem such matters relating to the circulation of air currents in stoves as will reinforce her practical experience.

In view of academic traditions, it is not difficult to teach various sciences, as well as mathematics and drawing, as separate abstract subjects. It is now generally believed that for most pupils, at least, the learning of these subjects in the abstract does not contribute to efficient vocational training. On the other hand, the integral correlation of phases of these technical studies with practical work presents obvious pedagogical difficulties, but its vocational value is unquestioned.

V. TYPES OF SCHOOLS FOR VOCATIONAL EDUCATION.

1. **Vocational schools classified.**—Vocational education in schools, like other forms of education, may be carried on in day schools (in which the student is under the control of the school for substantially all of his working time); evening schools (in which the student is regularly employed, and is under direction of the school only for his evening hours); or continuation schools (in which the student is regularly employed, and is under control of the school only for a limited number of hours taken from his working day).

These schools may be further classified as follows:

Day vocational schools:
- (*a*) Unified, or combined.
- (*b*) Dual, or cooperative—
  - (1) Full responsibility.
  - (2) Part responsibility.

Evening vocational schools:
- (*a*) Preparatory.
- (*b*) Extension.

Continuation vocational schools:
- (*a*) Preparatory.
- (*b*) Extension.

2 (Definition). **A day school for vocational education is one which requires that the pupil be under the direction of the school for substantially the greater part of each working day, for at least five days in each week, for the major portion of each year.**

Day vocational schools are of several types, according as the practical or productive work in them is done under the same roof and in

direct relation to the technical instruction, or separately from it. Among these are the "unified" or "combined" type, and the "dual" or "cooperative" type.

3 (Definition). A day vocational school of the **unified** or **combined type** is one in which all phases of a complete program of vocational education are carried on under one roof, or general building, under the immediate control and direction of the school.

The following are examples of unified, or combined, day vocational schools: A medical college immediately controlling its own hospital, and opportunities for clinical and practical work; an engineering college possessing its own shops, summer camps, mines, etc., for experimental and practical work; an agricultural school owning its own farms, gardens, and live stock; a commercial school with differentiated opportunities for various forms of practical work in accounting, typewriting, salesmanship, etc.; an industrial school having its own productive shops and other facilities for constructive work; a home-making school owning a house or apartment in which practical housekeeping is carried on, including such branches as cooking, sewing, laundering, care of rooms, nursing, etc.

It is a present tendency in vocational education to insist that the practical work given in training shall be of a productive, commercially profitable, and marketable character. Hence, we have instances of medical colleges managing serviceable hospitals; normal schools using as practice schools public schools in the community; schools of carpentry leasing or buying land, erecting buildings, and selling the same; dressmaking schools marketing their product; electrical workers' schools doing necessary labor about school buildings; printing schools taking orders on a commercial scale; home-making schools supplying meals and other products for sale or use outside; etc.

A few instances exist where day vocational schools have complete control of practical work carried on within the confines of an industrial or other establishment at some little distance, but which is, nevertheless, completely under the control of the instructing force of the school.

4 (Definition). A day vocational school is of the **dual** or **cooperative type** when the complete program of vocational training involves the cooperation or other relationship of two agencies, one, more specifically the school, giving technical and related instruction, and the other an institution or agency having commercial or practical ends in view, but placed in a cooperative relationship as a means of furnishing opportunities for practical experience to properly prepare pupils.

The dual, or cooperative, day vocational school is of two distinct types, according as (*a*) the authorities in control of the school also

control the adjustment and assignment of the practical and productive work as this may be used for educational purposes, or (*b*) the control of the practical work for learners is independent of the school authorities.

5 (Definition). A day vocational school of the dual or cooperative type is a **full-responsibility school** when it has the direction of the arrangement of practical work for learners when this is carried on in independent establishments.

The following are examples of day vocational schools of the cooperative type having full responsibility: A medical college sending its students into hospital practice in a hospital under other management, but with arrangements whereby the work done by the students shall be completely under the direction of the college authorities; a normal school sending its students into the public schools of a local community, the students remaining completely under the direction of the normal school authorities; a group of engineering students taking a job of practical work, to be carried out wholly under the direction of the college authorities; an industrial school sending a group of boys into an industrial establishment, where equipment and space are placed at their disposal for carrying out productive work, the actual program of such work being under the direction of the school authorities; an agricultural school, the pupils in which carry on, on their home farms, practical productive work under the complete direction of the school.

6 (Definition). A day vocational school of the dual or cooperative type is a **part-responsibility school** when the actual work of students sent into other establishments for purposes of practical training is controlled by, and largely under, the direction of the industrial establishment itself.

The following are examples of the dual or cooperative type having part responsibility: A normal school sending its students into public schools where these students are not under the control of the normal school, for the sake of practical experience; an engineering school arranging that its students shall have opportunities for practical work on railroads, in mines, and elsewhere, in the capacity of assistants or laborers; a commercial school sending its students into offices or mercantile establishments during busy seasons or at other times, for practical experience; an industrial school arranging the group of its students who shall, during alternate weeks, or at other regular intervals, work as apprentices, assistants, or laborers in industrial establishments; an agricultural school sending its pupils out on farms for practical experience, or in cooperation with parents or others in carrying out practical processes on the farm; a home-making school sending its pupils into their own homes to carry on the home processes, subject to the requirements of the home itself.

(*a*) The day vocational school of the cooperative "part responsibility" type must not be confused with the "part-time" school, which receives pupils from industrial establishments where they are already employed. (This type of school will later be defined as a modified form of continuation school.) At times the actual distinctions in character between the operations of the two schools may be difficult to define; but the essential difference is determined by the fact that in one type the pupils go from the school to the employing establishment with a view to obtaining practical experience, whereas in the other type the pupils go from the employing establishment to the schools for the purpose of obtaining supplemental training. The latter is properly "trade-extension training," discussed under continuation education.

(*b*) The efficiency of any form of dual or cooperative vocational education depends upon the degree to which the practical experience obtained in the shop and the technical instruction obtained in the school are coordinated, correlated, and integrated. In some existing so-called part-time plans the practical work of the pupil is only remotely related to the technical instruction. Such an arrangement results in poor vocational education. An agricultural student spending his summers on a farm will obtain valuable practical experience, but much of it, being unrelated to his school work, will not constitute a valuable part of vocational education. Technical instruction in homemaking, without practical experience under the direction of the school, is but poorly supplemented by the miscellaneous practical experience obtained at home. To send a commercial pupil into an office or mercantile establishment during a busy season is much better than no practical experience during the course of school training; but such practical experience will be related only remotely to the concrete teaching. Normal schools find the practice of sending students into schools not under their direct control of doubtful value, and in any case helpful only in the last stages of their vocational training.

(*c*) Theoretically, vocational training under cooperative or dual arrangements should ultimately prove the most effective, if proper coordination of the separate agencies can be procured, because then the required practical experience is obtained under genuinely commercial conditions, a situation most difficult to develop in a unified day vocational school. Satisfactory coordination of effort between school and commercial establishment for dual or cooperative vocational training is now difficult to obtain, partly (*a*) because commercial and industrial establishments conducted for profit are indisposed to advance learners through successive stages of practical work, and (*b*) because teachers of technical studies are indisposed or unable to adjust technical instruction to the requirements of practical

experience, preferring to teach technical studies on some purely logical basis. In time the following two methods of meeting these difficulties may be developed:

(1) Vocational schools having groups of pupils in need of, and ready for, practical experience may offer the services of these to industrial establishments on suitable terms, on condition that these pupils, under the supervision of instructors, be allowed to fit into practical work at such places and to such degrees as will be educationally profitable, while at the same time involving no economic loss on the part of the employer. (This arrangement would be especially suited to pupils from 14 to 18 years of age.)

(2) Teachers of technical subjects will be required to adjust their instruction so that, as their students who are regularly employed in establishments are advanced from stage to stage of work, the technical teacher will adjust his training to the requirements of the practical work. This will usually require that subjects of study based upon purely logical foundations in technical subjects be replaced by short unit courses and exercises based upon the practical work of the student.

7 (Definition). **Evening vocational schools** are schools in which the hours of instruction lie outside of the customary working day. Evening vocational schools are of two types, extension and preparatory.

8 (Definition). **The extension evening vocational school** is a school in which a young person already employed in some occupation receives, during evening hours, vocational education in subjects closely correlated with the work which he follows during the day, and calculated to assist him toward greater efficiency or more advanced work in that calling.

The following are examples: A young man following the trade of machinist, receiving an evening-school training in mechanical drawing and calculations related to his work, or practical instruction on machines closely related to those he operates during the day, or calculated to give him more technical knowledge of them; a man already engaged in raising poultry, obtaining in night classes technical instruction in the more scientific phases of poultry raising; a man engaged during the day in the practice of medicine, law, or engineering, studying in an appropriate evening school subjects related to his professional work; a domestic employed in a home, studying more advanced phases of cooking and sewing, in evening classes.

9 (Definition). **Preparatory evening vocational schools are those in which is offered vocational training unrelated to the occupation followed by the student during the day.**

Few satisfactory examples are yet available as to profitable evening preparatory vocational education. The time is usually too short, the student too tired or uninterested to make satisfactory progress. The following examples are suggested: Girls in textile mills studying homemaking, the latter work being divided into short units, such as shirt-waist making, the preparation of lunches, laundering, etc. (as now provided in special legislation in Massachusetts); a bookkeeper taking machine-shop practice, with a view to becoming a trained worker upon a special machine; a clerk studying, in an evening law school, for the purpose of passing bar examinations.

It is important to consider how far preparatory work in evening vocational schools may be developed in the future on what is known as the "short-unit" basis. The most successful extension work in evening schools of a definitely vocational character is now organized on the short-unit basis, which means that the learner is enabled to acquire skill in a particular process, with a particular machine, or to learn how to solve certain problems or to use certain devices, the necessity for which appears in connection with his daily work. It is possible that in evening trade preparatory schools similar results can be procured by a strictly practical "short-unit" organization.

10 (Definition). **Continuation vocational schools** are schools which are attended for a limited number of hours each week, within the customary working-day, by persons regularly employed.

(*a*) Continuation vocational schools, like evening vocational schools, may be "trade extension" or "trade preparatory" schools.

(*b*) In practice evening vocational schools are adapted to workers upward of 17 or 18 years of age, while continuation vocational schools are primarily adapted to young workers from 14 to 18 years of age.

11 (Definition). **Extension continuation vocational schools** are schools giving instruction or practice directly related to the occupations being followed by the pupils.

If the time given to the school is considerable—perhaps alternate days or weeks, or a half of each working-day—then such schools are often called "part-time schools." Many, if not all, of the great variety of occupations followed by young persons offer opportunities for supplemental or extension training in vocational schools on the continuation basis. The following are examples: A messenger boy learning the geography of the community in which he works in order to improve his efficiency as a messenger; a machinist being taught in short-unit courses a variety of devices and operations essential to his advancement or greater efficiency; a salesgirl being taught devices of salesmanship; a farmer being taught particular phases of tillage, animal husbandry, etc.

12 (Definition). **A preparatory continuation vocational school** is one which undertakes to teach the student a new trade or other occupation, or to give him an essential part of the training required for such trade during hours in which he is in attendance.

13. **Modified forms of continuation vocational education.**—Various modified forms of continuation vocational education exist, according to the character of the occupation followed and the time available for related study.

Part-time vocational education includes plans whereby young people regularly employed are released for regular periods, sometimes alternate weeks, in order to obtain instruction and practice in matters related to their ocupations. Farmers during dull seasons attend the short courses offered under extension agencies or in agricultural colleges. Apprentices are sometimes sent away to other establishments for temporary employment, primarily to learn new or related processes. Physicians in practice sometimes engage in hospital practice for short periods, in order to obtain new knowledge. In Germany and England the more capable workers in certain technical trades are sent to special schools for limited periods to acquire mastery of mathematical and technical processes needed in order to become foremen or overseers.

"Improvement" or "general" continuation schools, not of a vocational character, are common in Germany and are found at present in two or three States of the United States. These aim to utilize the continuation period of instruction to further general education.

VI. ADMINISTRATION OF VOCATIONAL EDUCATION.

The administration of publicly supported vocational education involves the same problems as those found in the public control and direction of general education. The relationship of the administrative organization of general education to the administrative organization of vocational education introduces questions of "dual" versus "single" control. The types of schools and the internal organization of schools introduce problems of differentiation of schools, and divisions and departments within schools.

1 (Definition). **Dual administrative control** of education exists when, either in the State or in the local community, or in both, the agencies for the control of vocational education are distinct from those for the control of general education.

Examples. In Massachusetts for several years a commission on industrial education had complete authority over industrial schools on behalf of the State, its operations having no connection with those of the existing State board of education. In a few Massachusetts

communities, separate boards of trustees are in charge of industrial schools.

2 (Definition). **Single administrative control** is found when vocational schools are organized and supervised by the same authorities as those charged with responsibility for general education.

In Massachusetts at the present time, the State board of education exercises certain functions alike with reference to vocational and general education. In most Massachusetts communities, a local school committee, working through a superintendent of schools, is in charge of both forms.

In practice, neither dual nor single control is found in a pure form. Experience shows the wisdom of arrangements whereby, in communities properly appreciative of vocational education, there shall be ultimate single control, but with a differentiation of specific agencies for the direction and supervisiou of each form of education.

For example, in Massachusetts a single board of education, working through a commissioner, supervises on behalf of the State vocational education and so much of general education as it is authorized to supervise under the law. Under the commissioner, however, is one deputy commissioner designated to deal with vocational education, and another deputy commissioner to deal with other forms. Wisconsin, Indiana, New York, Pennsylvania, and Connecticut present examples of more or less modified forms of control. In some instances, where separate local boards exist, the board for vocational education may be created by the board in charge of general education, or the two boards may have common membership.

3 (Definition). **A vocational school** is an organization of instructors, pupils, courses, buildings, equipment, etc., devoted to vocational education for one or more distinct vocations.

An analogy is found in university organization, where, under one general control, departments, or schools for the teaching of the various professions and the liberal arts exist.

4 (Definition). **A vocational department** in a vocational school is an organization of teachers, equipment, etc., designed to train young people for a single recognized occupation.

Thus, a vocational industrial school may have departments for the training of plumbers, patternmakers, cabinetmakers, printers, etc., and experience may show that very little of the actual training required for these different occupations will be alike or in common. A vocational commercial school might have departments for the training of accountants, stenographers, clerks, salesmen, etc. A department of "general instruction" in a vocational school is an organization of teachers, equipment, etc., designed to give the non-

vocational instruction required in common by several departments of a vocational school.

5 (Definition). **A division in a vocational school** includes two or more departments dealing with related materials, and involving, to some extent, related processes.

Thus in a large vocational school there might be a wood-working division embracing such departments as patternmaking, cabinetmaking, and house carpentry; a machine-shop division; a printing division, etc.

6 (Definition). **A departmental advisory committee** in the administration of vocational education consists of two or more persons, preferably representing, respectively, employers and employees in a given vocational field, for which the department to which it stands in an advisory relationship is giving vocational training.

The successful administration of vocational education under public control requires the active cooperation of representatives of the occupations for which training is being given. A useful means to this end, where vocational schools are under the general direction of the regular school authorities, is the advisory committee consisting, in the main, of employers and employees in the particular industry for which a given department is offering vocational training. Good administration requires that the advisory committee shall be brought into intimate consultative relationship to all new proposals as to standards and conduct of vocational training in the department concerned. The responsible head of the department must, in an executive capacity, be responsible for securing the conditions which shall enable the advisory committee to be active and effective.

VII. PRACTICAL ARTS SCHOOLS, DEPARTMENTS, AND STUDIES.

In private and public schools a variety of studies and practices have developed during recent years that may be described collectively by the words "practical arts." Various forms of practical arts education are to be sharply distinguished from vocational education. Experience proves that practical arts training, of one form or another, may make valuable contributions to general education. It is not yet evident that practical arts education, as ordinarily carried on, makes substantial contributions to vocational efficiency. It may be made to affect vocational choice and perhaps stimulate vocational ideals. Among the forms of practical arts education are these:

1. **Manual arts training in lower grades.**—Manual training in lower grades is that form of practical arts education in which boys and girls, usually during the work of the first six grades, have practice with a variety of exercises or projects resembling projects carried on in practical life.

This manual training includes whittling, clay modeling, paper folding, picture mounting, needlework, weaving, and a variety of other constructive activities within the range of the experience of children under 12 years of age. In this work, boys and girls usually do the same exercises, and these are taught by the regular class teacher.

2. **Manual training in upper grades and high schools.**—Manual training in upper grades and high schools, as the term is now used, applies mainly to wood and metal working, including at times printing, bookbinding, and various forms of constructive work as arranged for boys from 12 to 16 or 18 years of age.

In this field of manual training, well-defined programs of bench, forge, and metal working are now found. This work is usually taught by a departmental teacher.

3. **Household arts for upper grades and high schools.**—Corresponding to manual training for boys from 12 to 18 years of age are now found in upper grades and high schools a variety of practical exercises in cooking and sewing, and occasionally in other home-making fields, designed to give girls from 12 to 18 years of age insight and taste with regard to domestic operations.

In forms slightly, if at all, modified the same subject is called "home economics" and "domestic economy." Sewing and its allied lines are sometimes included under the term "domestic art," while cooking and its allied lines are sometimes called "domestic science."

4. **Agricultural arts education.**—In some elementary and high schools exercises based principally upon tillage are now found as constituting a phase of general education. In some cases home gardening, school gardening, and laboratory work in agricultural science are added, as well as reading exercises regarding live stock, etc.

5. **Commercial arts or business education.**—In elementary and high schools a variety of studies and practical work in bookkeeping, typewriting, commercial paper writing, and the like have been introduced in recent years, but no real distinctions between "vocational" commercial education and "general" vocational education have yet been made.

6. **Practical arts high schools.**—Under the influence of the movement for manual training a variety of special forms of high schools have developed, each frequently with some special characteristics. They are variously known as "manual-training high schools," "manual-arts high schools," "mechanic-arts high schools," "technical high schools," etc. A practical-arts high school in Boston is organized for girls' work in household arts exclusively. Technical or manual training high schools frequently have departments of household arts for girls.

VIII. PREVOCATIONAL EDUCATION.

1. (Descriptive). Within the last few years the term "prevocational education" has been introduced into educational literature, apparently with several meanings.

(*a*) The term "prevocational education" sometimes refers to studies and practices which, while not constituting a specific part of vocational education, nevertheless, are assumed to be a valuble or even essential preliminary thereto.

In a broad sense, ability to read and write is preliminary and essential to almost any form of vocational pursuit under modern conditions. Similarly, a knowledge of arithmetic is essential as preliminary to the commercial and many other callings. In professional education biology and chemistry, for example, are frequently spoken of as "prevocational" to the study of medicine; history and economics to the study of law; Greek and Latin to the study of theology; mechanical drawing and trigonometry to the engineering professions, etc. Similarly, it has been held that manual training or sloyd (tool work with wood and metals) can be "prevocational" to the mechanical trades. Whether any particular study "functions" as prevocational training can, of course, be determined only by observation and experiment.

(*b*) The term "prevocational education" at present seems more commonly to be used to designate programs of instruction and training designed to assist an individual in making an intelligent choice of an occupation, through giving him opportunity to participate in a series of practical experiences related to many vocations.

For example, it has been asserted that manual-training courses are, or can be made, of value in enabling a boy to "find himself" as regards his natural aptitudes for some one of the tool trades. Similarly, it has been asserted that so-called "commercial" studies and practices as found in public high schools enable the youth to "find himself" as regards his aptitudes for some commercial calling. It has been claimed that students taking mechanical drawing frequently discover from this their qualifications or lack of qualification for various trades in which mechanical drawing applies.

(*c*) The importance of prevocational education of the type described under (*b*) increases in proportion as intelligent vocational guidance develops, on the one hand, and varied opportunities for systematic vocational education are established, on the other. We may assume that, in time, in any urban community a large number and variety of departments of vocational education will be open to a youth at 14 or 16 years of age. It will be important that the youth choose wisely the school which he shall enter. It is not economical on the part of a vocational school to admit a considerable number

of persons who must early be eliminated because of innate or other disqualifications for the work selected. If programs of prevocational education can be developed which will accomplish this end, much good will result.

It has been suggested, for example, that through the seventh and eighth grades, instead of the present somewhat rigid courses in manual training, there should be presented to boys a large variety of opportunities to participate in constructive and practical work along industrial, agricultural, and commercial lines. The exercises and opportunities for practical achievement should be related as closely as practicable to various occupational pursuits as now followed. Considerable opportunity for election should be given, and for the early giving up of uncongenial forms of work. Good amateur standards should prevail in this work, rather than so-called "professional standards." The teachers should be persons possessing varied forms of skill and wide industrial experience, selected with a view to their capacity to advise boys wisely as to vocations in which they would probably succeed. Similarly, it is suggested that opportunities could be provided for girls to "find themselves" in homemaking, industrial, and commercial pursuits.

(*d*) The problem of the immediate future is to define the purposes of prevocational education, if useful purposes can be found, and then to adapt programs of practice and instruction to the realization of these ends.

2 (Definition). **Prevocational education** includes any form of education designed to enable a youth to discover for which one of several possible vocations he is best fitted by natural ability and disposition, the program of instruction and practice for this purpose being based mainly upon actual participation on the part of the learner in a variety of typical practical experiences derived from the occupations involved.

IX. VOCATIONAL GUIDANCE.

1 (Descriptive). Vocational guidance represents an attempt (first through philanthropic initiative and support, and later appearing through agencies for public education) to lessen the misdirection of energy and general loss of effectiveness at present involved in the efforts of young persons, especially in urban centers, to find suitable employment.

The historic agency of vocational guidance has been the home. Under primitive and settled conditions, the occupation of the child usually followed that of the father. In the modern urban community, the home becomes less and less adapted to giving effective vocational guidance. There is also available, now, a large amount of organized knowledge as to hygienic conditions surrounding any

given field of work, the requirements which such work makes for intelligence or special training, etc., which can be imparted by organized effort. As conditions now exist, youths are commonly unprepared to take advantage of the opportunities for becoming more efficient and for promotion.

2 (Definition). **Vocational guidance** includes all systematic efforts, under private or public control, and excluding the traditional activities of the home, the conscious and chief purpose of which is to secure the most economical and effective adjustment of young people to the economic employments which they can most advantageously follow.

Examples of the various means now employed, at least occasionally, for this purpose are: (*a*) Selected readings given under the guidance of the school, with a view to conveying information as to economic activities, the qualities demanded in the various vocations, etc.; (*b*) systematic reading and study of specially prepared pamphlets descriptive of the opportunities, requirements, etc., of various particular lines of employment—usually given under the direction of teachers—(*c*) individual or group conferences of pupils with teachers, for the purpose of discussing vocational opportunities, conditions required, etc.; (*d*) systematic study of young persons from the standpoint of their physical and intellectual make-up, with a view to advising them as to lines of employment which they can most effectively enter; (*e*) "prevocational training" (see page 69), consisting of limited amounts of practical experience in connection with exercises taken from various lines of practical work, with a view to discovering the pupil's fitness therefor, or enabling him to discover his own more fundamental aptitudes and interest; (*f*) systematic study of various economic lines of employment, with a view to obtaining specific data to be used in advising young persons seeking employment; (*g*) maintenance of employment agencies for young persons in day or evening school, with a view to assisting them to obtain work in suitable occupations.

Vocational schools in general, in more or less organized forms, offer vocational guidance and act in a measure as employment agencies in placing their graduates. This is especially true of normal schools, industrial schools, commercial schools, technological institutions, and universities.

Chapter IV.

SOME WAYS IN WHICH VOCATIONAL EDUCATION MAY BE INTRODUCED.

The introduction of vocational education into any community at the present time is dependent upon certain rather clearly defined factors which are peculiar to this type of educational development. Among these are the lack of a body of preconceived notions of educational theory in this field, the recent demands of industry for trained workers, the failure of industry to be specific as to those demands, and the failure of the public schools to meet fully the needs of a large mass of pupils in the schools after the age of 14.

Experience is increasingly recognizing the fact that vocational education is a local and not a general issue. That is to say, its content and method as well as its organization must be adapted to the social, industrial, and educational conditions of the community, all of which conditions differ with localities. These conditions are obviously different in a New England textile city from those of an agricultural community. They are different also in a large city with greatly diversified industries from the conditions in a city with a single dominant industry, and different again in a community of from 10,000 to 25,000 inhabitants from those in a community which is either larger or smaller.

The above facts would therefore seem to indicate the need of a careful systematic analysis of all the conditions involved before the introduction of any system of vocational education is undertaken. Nor should such an analysis or survey be carried on by the school men alone. The close cooperation of employers and employees in the trades and vocations of the town is needed, if effective thinking and action are to result. To be more specific, it would appear that the most effective means of bringing about the additional equipment for vocational training is through the enlistment of the united interest and support of all forces working for community betterment; such as boards of trade, labor organizations, civic and educational associations, etc.

It is also clear that, in order to meet the exigencies of a changeable public opinion, such an analysis will require a democracy of interest. This will involve the inclusion of all forces of whatever nature at work in the community, if the result is to be permanently worth

while. Although it may be objected that this method is somewhat cumbersome and slower in operation, it is given emphasis here because of the well-known fact that several sincere and well-intentioned efforts have been ineffective through failure to use in a democratic way certain available sources of interest and help. It has been found, therefore, that full cooperation within the community itself may be best secured by the backing of a central board or a central committee made up of representatives appointed from the several organizations and interests which are in any way concerned. Such a committee in every case should include persons from the industries, both employer and employee, from the lay public, and from the school public.

The securing of such public interest and support requires a continuous campaign of publicity which will attract public attention sufficient to bring about a local demand for such an investigation and report. It would add materially to its value were such a report to thoroughly analyze the local situation and through constructive recommendations point out a line of action which appears to be reasonably easy of accomplishment and most likely to be effective. Such a comprehensive study might secure added strength, probably greater interest, and possibly more nearly convey the full meaning of the movement were it to be designated a "survey."

Such a survey will of necessity be quite inclusive. It should keep clearly before it the facts concerning each phase of the situation to be studied. It should be both comprehensive and detailed. It should recognize all interested parties. It should eliminate no factor, however simple, which would seem to have a bearing upon the solution of the problem. The necessity, therefore, for arousing all of the dormant forces in the community is apparent. The successful completion of the undertaking will depend quite as much upon the extent and strength of the movement as upon the actual installation of the work. For the purpose of starting in the right direction, as well as for utilizing the varied forces in the most helpful way, the following suggestions are made. They show rather clearly definite steps which may be taken to foster an interest in vocational education which may later result in a definite demand for a survey of local conditions.

1. *By preparation and distribution of publications.*—The purpose of such publications should be not only to give accurate information in convenient form, but to present favorable arguments based on local facts and needs. These might be accompanied with, or followed by, publications from outside sources and from authorities on the subject.

The support of local newspapers should be secured in the printing of press articles and editorials on the subject. Newspapers afford

one of the most effective means for creating interest in the subject and for bringing about on the part of the public an understanding of the aims and purposes involved to an extent which will seem favorable to public action and support.

2. *By meetings to create local interest.*—(*a*) Holding of conferences at which speakers from within the city or town may tell of needs as they see them, or speakers from out of town may be secured to tell of what other places have found out and done.

Such conferences may be in the form of luncheon or dinner meetings or they may be of greater length, at which specific questions may be taken up and discussed.

At each conference on the subject the use of lantern slides and moving pictures will serve as effective means for impressing those present with the need and possibilities of vocational education.

Slides are obtainable from many State and city departments of education and a number of reels showing vocational institutions have been made by the National Manufacturers' Association; the United Shoe Machinery Co., of Beverly, Mass.; and the National Cash Register Co., of Dayton, Ohio.

(*b*) Holding of exhibitions.—Conferences may often be combined with the holding of exhibitions of school work done either locally or abroad, although the combining of the two is not essential. Care should be taken that any such exhibitions be made with due regard to satisfactory display and in a form of presentation which will attract interest and tell a story which can easily be appreciated. They should be given in places easy of access or in places where the people whom it is desired to reach are likely to congregate.

It has been found to be of little value to present exhibitions that do not carry the story to people by an appeal through motion and color, as well as through the intellect.

At an industrial and commercial exposition held under the auspices of the Boston Chamber of Commerce the education committee of that chamber secured the cooperation of public and private school authorities, in planning and carrying out an unusual educational section to that exposition.

In the idea of its presentation and the scope of the work shown, the exhibit was unique, not only in being a fairly comprehensive showing of the opportunities for industrial education in Massachusetts, but especially in its presentation of these opportunities by types instead of by individual schools, the separate institutions subordinating themselves for the sake of giving to the public a clear impression of the chief methods of meeting this important problem.

In connection with this same exhibit there was issued a joint circular, presenting in a brief form the opportunities for vocational education available in Boston and vicinity; and as a further valuable result, there was brought about a joint movement among those in charge of such education to prevent unnecessary duplication and to secure the benefits which come from cooperation.

Other notable examples of the effectiveness of such exhibitions were those of the education department of the Philippine Islands and of

the Massachusetts exhibition of vocational education at the Panama Pacific Industrial Exhibition. Exhibitions offer an opportunity to distribute in an effective way literature dealing with the subject.

Publications that will be helpful in the preparation of publicity material are those issued by (*a*) National Society for the Promotion of Industrial Education; (*b*) Russell Sage Foundation; (*c*) Trade-unions; (*d*) Manufacturers' organizations; (*e*) State education departments; (*f*) The United States Government.

3. *Central committee.*—After a favorable public interest in the local situation has been awakened, the community itself will see the need of the appointment of a central committee. As previously indicated, this committee should represent a variety of interests. It should be democratic both in its composition and in its action. It should organize in the usual way with a chairman and secretary, and possibly with subcommittees to look after specific details. Among its first duties will be a continuance of a policy of publicity in regard to community needs, community possibilities, and community limitations. A partial recognition of these needs, possibilities, and limitations should soon result in a desire on the part of the committee for a more detailed study of the local situation than can be made by any body of busy men engaged in their own occupations. This will pave the way for the appointment of a person to organize and carry forward a detailed study or survey of the exact local conditions. It will become evident that no preconceived notions of education nor prearranged plan for such a survey will actually meet the local necessity.

4. *Preliminary considerations.*—Previous to the selection of a person to carry forward such a survey certain pertinent facts should be borne in mind by the committee:

1. That whatever differences there are between the members of the group as individuals, they all must unite upon the one idea of getting at the actual facts.
2. That neither partiality nor prejudice should sway the committee to draw conclusions or make deductions until all of the facts bearing upon the situation have been presented and analyzed.
3. That local pressure and local bias for any particular plan shall be withstood, except in the light and bearing which such expressed opinion may have upon the situation, when a full knowledge of the facts has been ascertained.
4. That above all a spirit of openmindedness, cooperation, and good will shall pervade the committee in its work. With such a series of understandings carefully organized and agreed upon the committee should proceed to the selection of a competent surveyor.

5. *Surveyor.*—It is at once recognized that it will not be possible for every town or city to secure the services of a professional experienced surveyor. In many instances it will be necessary to select the best person who at the time is available for the work. In general, it may be remarked that the one who is in charge of the survey should be a man with breadth of outlook, careful judgment unbiased by prejudice of any sort, considerable initiative, organizing power, some capacity for the interpretation of the facts obtained, and a fairly wide knowledge of school, social, and industrial conditions. In short, he may well be selected with the thought that he is to become later the director of vocational education in the community in which he has made the survey.

6. *The survey.*—As yet there is lacking both sufficient experience and agreement on the part of investigators to justify the setting up of specific methods for organizing a vocational survey. There are, however, certain deductions which may be made from existing surveys which are of material assistance in the formation of plans for a specific survey. For example, it will be necessary to know something about the social, economic, industrial, and educational conditions within the given municipality. It will be left to the director of the study to interpret the data gathered and to translate them into terms of local activity or into terms which shall give to the town or city certain rather definite reasons either for establishing particular types of schools or rather more definite reasons why no vocational schools, as such, should be established.

Inasmuch as the gathering of data and their interpretation are to be centered in the one individual, the following suggestive outline has been prepared, not so much showing a complete program as pointing out a line of attack which heretofore has been found to have sufficient merit to be workable. While possibly not all of the steps indicated have been utilized in any one study, each of them may be found as a part of some individual study.

1. *Facts about the People.* (While this may be somewhat too inclusive as a major division, it is used here in the restricted sense of a single locality.)
   - (*a*) Population extent. The whole program will depend much upon the size of the community.
   - (*b*) Migration. That is to say, whether or not the population of the city is stable or movable.
   - (*c*) Conditions as to type.
     - (1) White or colored.
     - (2) Native or foreign born.
   - (*d*) Illiteracy.

2. *Economic Factors.*
   - (*a*) Tax rate, local and State; the whole tax burden.
   - (*b*) The indebtedness of the town or city.
   - (*c*) Conditions of waste in the expenditure of all public moneys.

2. *Economic Factors*—Continued.
   (*d*) Possibilities for effecting economies by a reorganization of the present system of education.
   (*e*) The amount of school funds, from whatever source, available for local use.
3. *Industrial Factors.*
   (*a*) Apprenticeship.
      (1) How extended.
      (2) Lack produced what result.
      (3) How to supply lack.
      (4) Not needed because of type of labor employed, mature workers only, etc.
   (*b*) Whether there is a content of technical knowledge or skill in any job that can not be acquired through routine work and for which special instruction is needed.
      (1) If so, what is it?
      (2) Whether it can be best imparted by provisions inside the industry.
      (3) If not, whether it is worth while to provide for such instruction through outside agencies.
      (4) If this is true, whether such instruction shall take the form of—
         (*a*) All-day industrial schools.
         (*b*) Trade schools.
         (*c*) Part-time industrial classes.
         (*d*) Evening classes.
      (5) Whether there are any jobs for which it is not desirable either to direct the youth or to train him at public expense.
      (6) What number of new workers could be prepared for any job, if it has a teachable content, without overstocking the market.
      (7) What kind of equipment as to age and physical and mental assets the workers should have for the job.
      (8) To what extent does the industry select its workers for any job so as to secure those best adapted to it.
      (9) Whether their market is overcrowded.
4. *School Factors.*
   (*a*) The number of children leaving school each year.
   (*b*) The nationality, age, and schooling condition of those withdrawing.
   (*c*) The economic condition of those withdrawing.
   (*d*) The wages, number of jobs, kinds of work, and advancement of those withdrawing.
   (*e*) Causes of retardation.
   (*f*) Causes of withdrawal.
   (*g*) Education after leaving school.
   (*h*) Means of getting a job.
   (*i*) Comparative amount of idleness of nongraduate, graduate, and high-school group.
   (*j*) The aim, character, and extent of prevocational training in the elementary schools.
   (*k*) The aim, character, and extent of manual training in elementary and high schools.
   (*l*) The aim, character, and extent of the evening schools.

Chapter V.

METHODS OF ORGANIZATION.

As a result of a local survey, it is assumed that some form of vocational education should be undertaken. The particular type of such education to a considerable extent will indicate the method of organization. To avoid future complications and misunderstandings, the details of the plan should in all cases be determined so far as possible previous to the actual inauguration of the work. It should also be clear that in most of the States the local authorities will be the initiators of the work and will have the responsibility for its successful operation. In some States the central authority of the State will assist in the preliminary steps, will set standards and requirements, will approve the actual plans in advance, and will share in bearing the financial burdens.

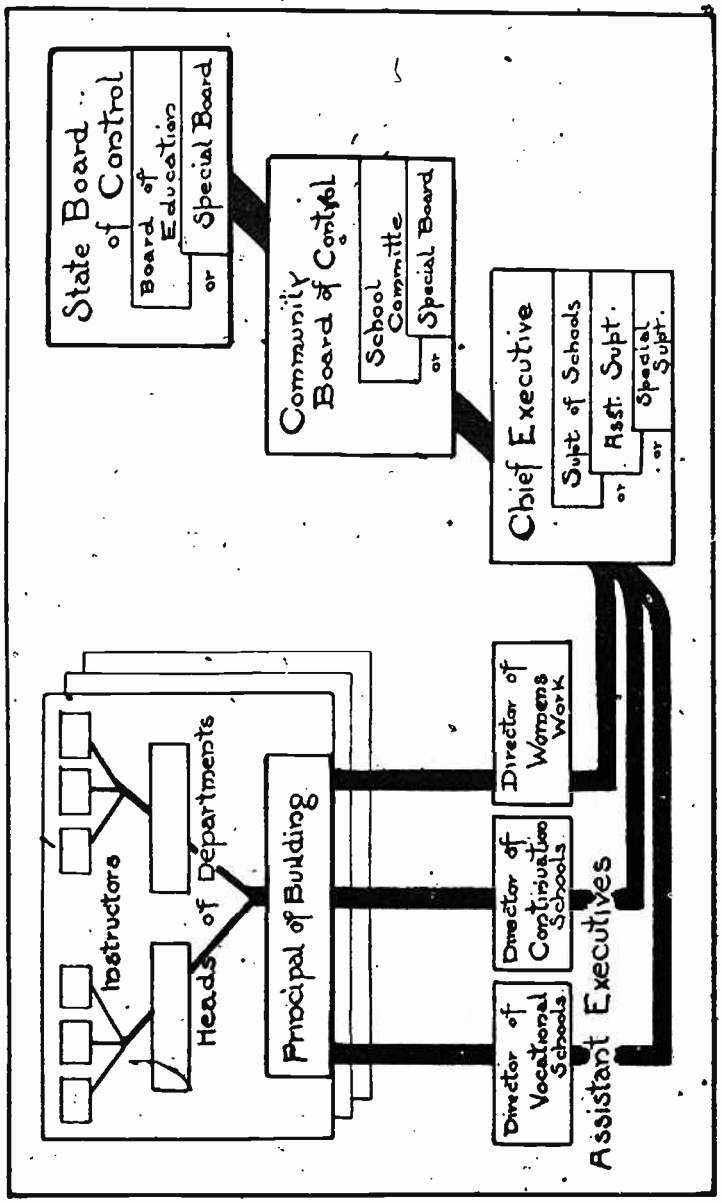
STATE ADMINISTRATION.

It will be found in most States that there are certain legislative enactments and requirements which affect the installation of vocational work. It may be found in some of the States that the State constitution itself, as well as some of the legislative enactments, while not prohibiting, may, by restrictions as to compulsory attendance, etc., practically prevent the local authorities from undertaking this work. In short, these requirements will afford an effective barrier against any form of vocational education for persons between the ages of 14 and 18 years.

At the present time in several of the States direct provision has been made for the sharing of responsibility, both educational and financial, by the State. In other States it will be found that certain State funds may be transferred or made available for this work. This may be particularly true in those States in which there is a large income from excise taxes, and the various school funds established under the act can be utilized.

The central State authority in some States will have the power to set up certain definite standards and requirements as to the qualifications of the officers and instructors who are to have charge of this

work in a given community. For example, some States have gone so far as to say that a person in charge of vocational work should be



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a person acquainted with the needs of the industry as well as with certain and somewhat definite educational equipment. It has been

determined also that the instructors for trade work shall be persons who have had a considerable background of actual experience in the trade which they are to teach, that the instructors who are to teach the technical studies which are related to the work shall be persons who have a considerable acquaintance with the trade or industry for which the instruction is to be given.

Again, the State may set up certain definite restrictions and requirements as to types of buildings, whether or not the work shall be carried on in a school building or factory building, in a building erected especially for the purpose, or in an old school building which has been reconstructed in such a way as to be most effective for the teaching of the trade in question. The State may even go so far as to determine the type of equipment which shall be used in each school, whether or not modern machinery shall be installed, or whether it seems more advisable to utilize machinery of a slightly earlier day for the purpose of meeting the local situation.

In some cases the State will insist upon a review and approval of the course of study to be offered before such courses of study are put in operation. In many cases this may forestall the inauguration of courses which will fail to teach the trade effectively. These courses will vary considerably in accordance with the needs of the particular industry. The person preparing the same should keep clearly in mind this objective; otherwise it will be found necessary continuously to revise and modify the courses to such an extent that it will be difficult to do satisfactory work. Another requirement which may often be established has to do with the person to whom this type of education shall be offered. That is to say, it may be offered only to persons of a certain age, from 14 to 16 years or from 14 to 30 years; it may be offered to persons with a previous grammar-school education or to persons who have completed the regular school work of the seventh grade; or it may be offered only to those persons engaged in the particular trade or in some branch of the particular industry for which the instruction is to be given. Certain other limitations may be placed upon the work by the State, such as the size of classes, length of time to be allowed each subject, length of time to be devoted to a single operation, length of time necessary for the full completion of the course. These requirements and limitations may be set up by the State for the purpose of providing standards of judgment, which may be used for approval or disapproval of the school. In many cases they will be set up as a condition for reimbursement by the State. In these cases it may be necessary for the local community to provide not alone for the pupils resident in that particular community but for nonresident pupils. In all cases, previous to the actual inauguration of the work, the local authorities should become familiar with these exact requirements and limitations set up by the

central State authority, for in this way will be avoided opportunity for misunderstandings and possible friction.

LOCAL ADMINISTRATION.

In all probability the most effective organization for the introduction of vocational education into any community of ordinary size will be the school committee of the town or city. This school committee, of its own initiative or through the initiative of its paid executive, the superintendent, will be the most likely to become interested in providing, first, for a type of training which shall meet the needs of that group of pupils who can not or will not profit by the general education or by the various arts courses which are ordinarily offered by the regular schools; second, a type of training which shall provide rather definitely a type of education which shall enable boys and girls of these ages to meet more effectively the requirements of an industry which, for economic or other reasons, they are obliged to enter at comparatively early ages. Furthermore, it is probably true that, because of economic and strategic reasons as well as because of lack of organization and manipulation, the school board will for some time be the most acceptable means for the successful administration of this form of education.

It should not be overlooked, however, that there are certain extraneous factors which enter into the permanent progress of vocational education. The factors are so well known that extended comment is unnecessary. They may be mentioned here to serve only as a guide to what experience has proven to be one of the best ways in which to secure the full cooperation of all forces in any way interested. It is clear that a group of manufacturers or a group of workers know more as to the requirement of a given industry than do a group composed, it may be, of professional men, general business men, and in many instances of women who make up the average school board. It is necessary, then, to provide some means by which those actually engaged in the administration of this work can be assisted and to some extent at least guided and directed by those intimately acquainted with the industrial conditions of the immediate locality. Again, those who have had to do with the introduction of the work, with the conduct of the survey, and with the recommendations made therein will be in a position to give more intelligent assistance than can be afforded by a group composed of persons who are unacquainted with these details. For these reasons it is highly desirable that the survey committee be continued as an advisory board to act in conjunction with the executive officer in charge of this work. In case it appears impracticable to continue the survey committee in every case, there should be appointed an

advisory board composed of employers and employees as well as laymen. While this board will act in an advisory capacity only, it will serve as a sort of clearing house through which the executive officer can forestall difficulties as well as readjust his own action and thinking, so that the work done will more nearly meet the needs of the worker and the work.

The foregoing plan places clearly the responsibility for the conduct of vocational education. In most communities the executive officers and workers in the field should be planned somewhat after the following arrangement:

1. Chief executive officers:
   - (a) Superintendent of schools.
   - (b) Assistant superintendent of schools.
   - (c) Special superintendent of schools in charge of vocational work.

In actual practice each of these three methods may be found. In any case they will vary with the size of the community and with the extent of the work to be done in vocational education.

2. Assistant executive officers:
   - (a) Director of vocational education.
   - (b) Director of men's work.
   - (c) Director of women's work.
   - (d) Director of homemaking.
   - (e) Director of continuation schools.
   - (f) Director of evening industrial schools.

Again, the necessity for these several directors will depend upon the size of the town or city and upon the number of activities to be undertaken in the particular field of vocational education. In the smaller city, in the city of one industry, as well as in the city which is to attempt to provide for only one of the types indicated, all of the duties will devolve upon one person. In some cases it will be necessary for the superintendent of schools to serve both in the capacity of supervisor and that of director. Hence, while the foregoing analysis sets up something of an ideal situation, there will no doubt be found necessary many modifications to meet the specific situation to which these principles may be applied.

3. Principals of separate buildings which have been set apart for instruction in vocational training.

As in the case of principals for schools of general education, the duties of this office may be either administrative and supervisory, or they may be a combination of these functions with those of instruction. For purposes of clearness in the differentiation of this work and general education, it would probably be better to denominate these men directors of buildings. In many instances it may be found necessary or advisable to place this work under the same roof as that

of general education. In such cases the term principal should be retained.

4. Heads of departments:
   (a) In a vocational school.
   (b) In a department of a vocational school.
   (c) In a department for vocational education in a general secondary school.

The suggestion is made here that such persons be denominated "directors" of this or that department rather than as heads of departments. It will occur that an overlapping of function will appear to be present; nevertheless, for purposes of clarity and actual ease in understanding by the laymen, it is advisable to distinguish in a rather definite way between the heads of departments in general education and the directors of departments in vocational education.

5. Instructors:
   (a) In industrial subjects—
      1. Shop operations.
      2. Shop practice.
   (b) In special technical subjects—
      1. Drawing.
      2. Chemistry.
      3. Physics.
   (c) In academic subjects—
      1. English.
      2. Civics. etc.

QUALIFICATIONS OF DIRECTORS AND INSTRUCTORS.

In the case of each of the several officers and instructors enumerated above, as previously indicated, there should be set up either by State or local requirement somewhat specific standards of attainment and qualifications. Until the work of vocational education has had a longer opportunity to crystallize, it will be necessary to use good judgment and common sense as to the administration of those standards. There are, in the main, four divisions into one of which all those who are immediately occupied in carrying on vocational education will naturally fall:

1. Directors of schools and directors of departments.—The principal or director of a vocational school should have had a thorough academic training and preferably experience with different lines of public-school work. He must be in sympathy with vocational education, have the vocational point of view, and sufficient technical and practical knowledge to enable him to administer the vocational work.

2. Shop and vocational instructors.—The shop instructor must know his trade as fully as does a skilled journeyman; and in addition must have the knowledge of the technical method in use in the trade, together with a command of its drawing, mathematics, science,

and art; he should further have a general education not less than that represented by elementary school graduation or its equivalent.

He should have some command of the technique of teaching and school administration, and he must be trained in the application of principles of teaching to industrial-school problems. He should have a background of educational principles, theory, and practice which will help him to understand the aim and place of his own work, and to interpret the social use of the school in which he serves. He must have the ability to make his own work serve the ends for which industrial schools are established, i. e., to fit boys and men for skilled workmanship and intelligent citizenship. He should have, or acquire, a grasp on the economic, social, industrial, and educational history and evolution that have led up to the movement for industrial education in our day.

The shop instructor's personal appearance, manner, and dress must be such as will not be a handicap to him as a leader of boys. He must use judgment and discretion in all matters relating to neatness and cleanliness in person and dress.

His personal qualifications must be such as to establish a presumption that he can perform the duties he undertakes. Consideration must be given to health, strength, and temperament, as shown by his ability to get along with people and his interest in community activities. He should be not less than 25 nor more than 40 years old at the time of entering the work. His habits must be such as will not bring him into disrepute in the school or community, or set a bad example for the students. He should show ability to deal with boys; and successful experience and interest in them and their sports are assets as a teacher. His manner of dealing with boys must, of necessity, be different from that which prevails in a strictly commercial shop.

3. Teachers and instructors of related subjects.—The ideal teacher of related subjects whom, admittedly, in practice it would be difficult to secure in large numbers, should have *trade* equipment, teaching equipment, and personal equipment equal to that set forth above for the shop instructor. In addition, he should have had as a minimum in academic instruction not less than that indicated by high-school graduation or its equivalent. He should show evidence of ability to teach the special subjects for which he offers his services by preparation of not less than two years beyond the highest grade he is required to teach. The ability to apply these subjects in a practical way to trade problems is also essential.

A man with trade experience equal to that desired for the shop instructor is best equipped to serve as a teacher of related subjects, but if such a teacher is not available, great care should be taken to obtain such experience or familiarity with the processes of the trade

as will equip him to teach his subjects so as to prepare a boy to use them in accordance with the best practice of the trade. The character and extent of the experience that would justify the presumption of ability to teach related subjects will vary for different trades, and can only be determined for any given trade by the judgment of those who have themselves had successful experience in it.

4. Teachers of nonvocational subjects.—The teacher of nonvocational subjects in an industrial school enters a field where few precedents exist. The practical character of the trade work creates an atmosphere which demands a concrete and practical presentation of the nonvocational subjects such as is not common in our traditional schools. A teacher can not expect to teach boys in these schools the same subject matter or by exactly the same methods pursued in high schools. He has a special field, and, to a large extent, unexplored territory. He must take the boys who come to him and so organize the subject matter as to make it an effective supplement to the other work of the school, and so far as possible to function in the life of the pupil.

His teaching equipment, personal equipment, and general schooling should not be less than are demanded for the teacher of related subjects mentioned above. In his special field he needs, perhaps, not more knowledge, but knowledge of a different quality and the ability to organize it. He should have an appreciation of the conditions and problems of modern industry such as can be expected of an intelligent layman, and a knowledge of the more common machines and trade processes carried on in the schools. A man with some natural mechanical ability, even from an amateur standpoint, is more likely to succeed in such work than one whose interests are entirely academic.

Experience as a wage earner is an asset, as it enables one to gain a sympathetic insight into the needs of the worker, to understand the aims and purposes of the industrial school and its responsibility for the pupil and to the industry; and to see clearly the relation of his own subjects to those of his fellow teachers, and the place and bearing of his service on the total service which the school undertakes to render to the pupil and to the industries.

Such a teacher must be able to use material drawn from the world of work in teaching such subjects as civics, economics, industrial history, and English. His work must interrelate with the affairs of the industry and the activities of the school, and on no account should be taught as something remote from the pupil's life and experience. His greatest effort should be to make his teaching of civics and economics develop principles that will enable the pupil as a wage earner to solve successfully his problems as a worker in industry and as an intelligent citizen.

PUPILS.

It has been found by experience that for most purposes the pupils in a school for vocational education should not be less than 14 years of age; that in day classes they should not be more than 25; and that in evening classes the lowest age of admission should be 16 years, with almost no limit beyond the requirement of the industry as to the maximum age limit. The qualifications of the pupils will vary with the needs of the industry. In general, however, they should be persons who have completed the seventh grade of the general school and who show that they are competent to profit by the instruction sought. In the part-time schools, in which approximately one-half time is given to instruction and one-half to the work, and in the evening classes they should in most cases be employed in the same industry as that in which they are being taught specific things concerning the allied trade or industry. The most marked exception to the above condition will be that in the case of "homemaking" for girls and women over 17 years of age.

SIZE OF CLASSES.

Actual practice has fairly established 15 as the most desirable group with which to work to advantage. As in so much of this work, the number of pupils in a given case must depend largely upon local conditions, upon the complications of the trade, upon uniformity or lack of uniformity of intelligence in the group to be taught, and upon the care with which the shop instruction is organized.

FACILITIES.

In general the location and construction of the buildings and the type and extent of the equipment should bear a direct relation to the needs of the pupil, to the needs of the industries for which training is to be provided, to the material prosperity or wealth of the community, and to the importance in which this work is regarded by the citizens.

In any specific case it is obvious that, in so far as possible, the location should be such as to convenience the majority of the pupils who are likely to attend. It should be located also with some regard to the industry, and with due consideration for lighting both day and evening. In actual practice the following provisions have been made for housing this special type of education:

1. The special school erected and fully equipped for this purpose. The best examples of such schools are the private schools, Williamson Trade School, at Philadelphia; the Wentworth Institute, at Boston; and the John S. Rankin, Jr., School, at St. Louis.

The Trade School for Boys, at Worcester, and the Milwaukee Trade School for Boys are examples of public schools devoted entirely to vocational work.

2. The old factory building remodeled. The chief objections to this adaptation will be improper location, inefficient lighting, and inadequate heating. It will have the advantages of adequate floor space, an atmosphere of reality, possibilities for rearrangement and additions and alterations. In some cases these latter may furnish excellent opportunity for constructive work by the pupils. Good examples of this type are the schools at New Bedford and Springfield, Mass., and the industrial school at Rochester, N. Y.

3. The abandoned schoolhouse remodeled as a shop. The chief advantages for this use of an old schoolhouse are the ease of accomplishment, especially during the experimental stages, the probable lessened cost and the creation of favorable public sentiment. Its disadvantages, like those of the old factory, may be location, improper lighting, with the added difficulties of construction, size and shape of rooms, and its appeal to the pupils. It isn't shop enough. Newton, Lowell, and Somerville, Mass., have each adopted this plan.

4. The utilization of a room or rooms in a regular secondary school building, which rooms have been fitted up for this purpose. This plan will be best adapted to the small community and to the community with limited financial resources. It should be clearly understood, however, that this work is conducted upon an entirely different basis from that of the regular high school, that it is proposed to reach a group who have not been prepared for the general secondary education offered in the general school. The requirements for the teachers should be those set up in a preceding section of this chapter, other than those for the general school. In short, the line of demarkation should be sufficiently distinct to make it clear that the pupils in this department are learning to do specific things which will enable them to earn better wages when they finish their training.

EQUIPMENT.

It is an unfortunate thing for an industrial school to have a complete building and equipment turned over to it at the outset. If the pupil is to be adjusted to meet the demands of the industry, his training must be real. If it is real, it must be given in a productive shop, making useful things that can be utilized in the school system or sold on the open market at or above the market price. Schools giving training in such subjects as woodworking, metalworking, electrical working, can readily find use for the work of the pupils either in

the building itself or in the school system. Every school should make a part of its own equipment. This has been done by most of the industrial and trade schools. Enough equipment ought to be bought at the outset to start the work. Sometimes an equipment sufficient to give the first year's training is bought, after which the pupils are able to make most at least of the tools and machines and facilities necessary for their further training in the following years.

Where schools find themselves with limited resources at the start, much secondhand equipment for use in the first year of the work at least, can be bought that will serve its purpose well. In the other years of the course, it is necessary to secure the very latest and best machinery, so that when the boy leaves the school he will be familiar with it and can take his place in the shop successfully.

One of the handicaps under which the school shop must always labor is that of keeping its machinery from time to time fully abreast of the best equipment of the commercial shop. It is doubtful whether this can be done altogether successfully. Under the stress of competition, the commercial shop changes its equipment from time to time. The school without such competition is very likely to remain content with machinery that is behind the times. This is one of the strongest reasons why the part-time scheme of education that enables a boy to get the most of his practical training in the industry itself promises to be most effective in dealing with the great body of wage-earners between 14 and 18 years of age.

Many enthusiastic supporters of part-time education have been led to claim that all the equipment the school needs in dealing with the wage-earner for the time which it demands away from the shopwork is a teacher, a textbook, a blackboard, and some desks. In their enthusiasm they fail to recognize the conditions under which most of those who are employed in the industries labor. Large scale production, extreme division of labor, and the specialized machine have supplanted the artisan or tradesman with the machine-worker. The old trades in which men were able to get experience with all the different tools, machines, and processes of their callings are rapidly disappearing. Modern industry does not give the worker a chance to get a broad experience in working with different machines. The typical boy who comes to the part-time school will be one who is spending his entire time at one machine, making one small part or portion of the final output of the factory.

The schools must always take the boy as it finds him and give to him the training he needs. In giving part-time instruction to the worker at the specialized machine, the school must provide under the school roof, if it is to meet modern industrial conditions, a sufficient amount of equipment to enable the boy to get the elementary practice and experience at the machines, with the tools and in the

process which the shop denies him and which is necessary to his insight, interest, and growth in the occupation. Every experience goes to show that a minimum amount of equipment under the school roof is necessary as a teaching device which will make it possible for the teacher to closely correlate or connect the instruction which he is giving with the shop processes as they can be illustrated on the machines.

One great mistake which many manual-training and technical high schools have made, and which industrial schools are in danger of making, is that of providing a large number of tools and machines of one kind rather than a smaller number of different tools and machines. There are manual-training and technical high schools in this country where in order to carry on the teaching of pupils in groups enough metal lathes have been secured to provide one for each pupil in the largest section which the school handles. This policy requires both an enormous building with many different shop rooms and a large outlay of money for equipment for the work, much of which is unnecessary and dooms the school forever to a system of training where the pupil is taught by the exercise rather than the job method, where individual instruction has no place, and where the pupils are handled entirely in groups. The same amount of money put into a more varied equipment would enable the school, whether it be a manual-training school or industrial or trade school, to deal with the pupils individually so as to give each a wider range of experience with different machines, substitute the individual for the group method of instruction, and to approach more nearly the conditions of real shopwork so necessary in the proper training for success in the industries.

KINDS OF SCHOOLS.

Any adequate program of vocational education must provide instruction both for those who desire preparation for a calling before entering it and for those whose advancement depends upon additional training of some kind after they are employed. In either case the instruction in one or more of the three forms of education—industrial, agricultural, and homemaking—may be given.

Schools planned for these two groups may be generally classified under three heads:

I. The all-day school, where the pupil devotes the entire school day to instruction.

II. The part-time or continuation school, where the pupil having already gone to work devotes a part of the working time for further education.

III. The evening school, where mature workers attend evening classes, receiving instruction supplementary to their day employment.

I. THE ALL-DAY INDUSTRIAL SCHOOL.

The survey will undoubtedly show the presence of a body of children who have left school at the age of 14 (or younger where the law permits), many of whom have not finished the elementary school. Because of their limited education, their lack of skill, and their immaturity, they will probably be found engaged in a variety of odd jobs, shifting about from one occupation to another, with little or no opportunity to advance in either skill or earning capacity beyond that which brings a meager subsistence.

It would appear, therefore, that for this group, who are likely to enter industry early, there is needed a school or courses which will minister to their vocational as well as their civic needs. While the all-day industrial school can seldom teach a trade in the fullest sense of the term, there is a fund of experience which shows that it can do much to prepare girls and boys over 14 years of age for entrance into the trades.

In these schools a close relation must be maintained between theory and practice. Practical shopwork must be supplemented by related studies in English, civics, industrial history and geography, and elementary mathematics, as well as by the science and mathematics underlying the trades. In this way the school will make for intelligent citizenship as well as for superior workmanship in the years to come. Shop conditions must be approached as nearly as possible in the school, and in general the following conditions should be met in the school:

1. Not less than one-half the time of the pupil should be given to actual shopwork, including such calculations and shop drawing as may be necessary to bring the projects of the pupils in the shop to successful completion.

2. The shopwork must be conducted on a productive or commercial basis as distinguished from the ordinary manual-training method of handling pupils in the shop.

3. The instruction must tend to become individual as distinguished from group or class instruction.

4. The shopwork must be carried on as nearly like the work done in a first-class commercial shop as conditions will permit.

5. The results of the pupils' work should be useful articles which can be utilized in the school system or have a market value.

6. The assignment of work to a pupil in the shop should be by projects or jobs.

7. The progress of the pupil through the shop and school should be measured by the projects or jobs which he has completed in a satisfactory manner.

8. The classroom instruction in the related academic subjects, such as arithmetic, drawing, and science, should be closely connected at every possible point with his shoproom experience in order that it may be of immediate practical value to the pupil.

9. Every day industrial school should plan for at least a one year's course and for not more than a four years' course.

10. Every year's work should, so far as possible, be a unit unto itself. Each year's work should be organized and administered in a way that would confer upon the pupil a definite value in vocational training, so that if he should leave the school at the end of the year the instruction could be used by him as a tool in trade for better wage earning.

11. Not less than three (60-minute) hours should be devoted each day to actual shopwork. The school session should not be less than six nor more than eight hours, not counting the recess and noon periods.

12. So far as feasible, instruction should be given in English, history, civics, and other appropriate subjects which would tend to make the pupils self-helpful, intelligent, and worthy citizens. The end of the vocational school should not be merely to produce a technically competent workman, but a *citizen of the State* who seeks not only to advance his own welfare through his work, but who is ready and willing to place his efforts at the service of his community and State.

II. THE PART-TIME OR CONTINUATION SCHOOL.

A second group to be considered in providing vocational training opportunities is that made up of young people who have left school before completing their elementary education and who are therefore handicapped by lack of schooling either for successful wage earning, or for intelligent citizenship. These young people are neither prepared to choose a vocation intelligently nor to follow it with sufficient prospect of future advancement, because the schools have assumed no responsibility for their preparation for employment before they must become wage earners. Under present social and economic conditions it is probable that the all-day industrial school, when developed to the full, will not reach more than a meager percentage of the youth. By far the largest number must be reached by the part-time schools, which will take a part of the working time of young persons between 14 and 18 years of age for continued education, either along the line of a chosen vocation or of general civic intelligence.

While, therefore, it is important to provide for preparatory vocational training for every boy and girl who can afford to spend even a year or two in school, beyond that which is required by law, it is more

important to provide for that great mass of children whose education is at present terminated by entrance to a "job," and whose only prospect for further education is dependent upon its not being divorced from the possibility of wage earning at the same time.

It is also true that to a large extent the schools have abandoned the adolescent wage earner entirely to the shop and the factory and have taken no further responsibility or care for his preparation or guidance, just at the time in his life when he most needs discipline, instruction, and the direction of his newly awakened social, civic, and industrial interests.

Very little, if any, of the work which he is doing is of a character which will permit of directly related teaching, so far as strictly industrial subjects are concerned. The industrial experience which he is probably getting in daily employment is frequently such as to enable him to profit greatly by subjects which, while not definitely connected with his particular job, would nevertheless lead to greater industrial intelligence and greater surety of future success as a trade worker.

Also there are many who believe that, while all-day industrial schools can give general industrial intelligence and helpful preliminary training for entrance to a trade, and that real trade preparation may be given to a limited few over 16 years of age in special trade schools, the understanding of the technical and theoretical part of a trade can in general be mastered only by those who are already engaged in actual practice in that trade. Clearly, therefore, one of the best ways that a small industrial community can provide vocational education is by the part-time plan. This provides for an equitable distribution of the responsibility for vocational education between the shop in which the pupils are employed and the school providing a few hours of instruction each week designed to make the young workers more efficient workmen and better citizens. The two large purposes of part-time instruction may be stated as follows:

1. To increase the general intelligence of young workers and lead them to understand better their social and civic duties.

2. To increase their industrial intelligence and skill and develop capacity for advancement within a given trade where such opportunity exists, or where it does not to prepare for some skilled and remunerative work in another line.

Such instruction will have in mind to provide, among other things:

1. Trade extension for the "next step up" within a given industry.

2. Trade preparation courses for boys and girls employed in juvenile occupations, in order that they may enter other and more favorable occupations when they are older.

3. General improvement courses for those employed in occupations where advancement is dependent upon increased civic and general intelligence.

4. Home economics courses for girls who are employed in any line of industry.

It is clear from the above considerations that part-time education will be of two distinct types, according to the amount of time per week given to school instruction:

First, the strictly part-time vocational school in which approximately one-half of the pupils' time is set apart for the school and one-half in some trade or part of a trade in a shop for which compensation is received.

Second, the part-time school of the continuation type, which is for the purpose of permitting the boy (or girl) for a few hours each week an opportunity to continue his education beyond what was possible under previous conditions because of economic pressure or other reasons.

It follows as a matter of course that the amount and kind of instruction that may be given in a part-time class may vary greatly. As to time devoted to the work, five or more hours may be given to the instruction per week, a day a week, or the half-time plan may be adopted, whereby alternate weeks may be given to the school and shop or farm. Whether the half-time plan or less than half-time plan should be used will depend, of course, upon the facilities which the school has for handling the classes, the amount of cooperation that can be secured from the employers concerned, the class of individuals to be served, etc.

DIFFERENT PLANS FOR PART-TIME WORK.

The following types of part-time instruction are at present being carried on in this country, or have been proposed as practicable schemes for part-time vocational work:

(1) Plans classified according to responsibility of employer.

(a) *The No-responsibility Scheme*, in which the employer does nothing more than to organize the factory or plant so that the pupils may have time off from the shop or factory during working hours to attend the school.

(b) *The Part-responsibility Scheme*, wherein the employer, in addition to making arrangements so as to afford time off for the school, pays the pupil for all or a part of the time spent in the school; i. e., pays for half or all the time lost from the business.

(c) *The Full-responsibility Scheme* prevails when the employer, in addition to arranging his work so as to cooperate with the school, agrees with the school authorities to give the young workers an opportunity to secure the round of experiences at the different machines and processes in the shop which will give them breadth of skill and insight as workmen and enable them to get the necessary instruction to learn the trade in the school. In most cases the learners are paid for the time they spend in the school. This plan is most often used in connection with the more important skilled industries.

(2) Plans classified according to time given to shop and school.

(a) *The Week-about or Half-time Plan*, in which alternate weeks are given to the shop and school. This is sometimes called the two-boy plan, because it is customary to assign two boys to the same task, one working in the shop while the other goes to school and then exchanging places the next week.

(b) *The Less than Half-time Plan:* This includes all plans which give less than alternate weeks to vocational instruction. The work may be arranged so that the learner has eight hours each week at the school, in some cases five hours a week, in still others from two to four hours. It may readily be seen that decreasing the number of hours given to the school decreases the difficulty of securing additional help, but increases the difficulty of organizing the work at the factory so as to permit the shifting of the workers in a manner necessary to permit them to attend classes.

(3) Plans classified according to enforcement.

(a) *Voluntary Part-time Schooling* contents itself with providing a school to give the vocational work and persuading employers, parents, and children to cooperate with the school authorities. Sometimes the employer arranges with the school authorities to have some or all of their young workers take the training by making attendance upon the school a condition for their employment.

(b) *Compulsory Part-time Schooling* occurs when the youth who has gone to work is compelled by law to give a part of his time to the school, and where the employer is required to arrange for time off for the class in order that the child may attend the school. This is the better plan and is the one provided for by the Indiana law.

In the introduction of this work the administrator or director should keep constantly in mind his objective. That is to say, his school or schools should be so organized as—

1. To meet the needs of the specific group of workers which have been found as a result of the survey.
2. To add to the technical knowledge and skill of the workers.
3. To make the instruction efficient.
4. To justify the expenditure of money for its support by the amount of time given to the work and by the amount of benefit derived from such work by the pupil.
5. To select for the school instruction data taken directly from practice of up-to-date industrial establishments.
6. To include at least one study in the course which deals directly with training for citizenship.

III. THE EVENING SCHOOL.

Whereas the part-time school has for its particular province the training of the boy and girl between 14 and 18, the evening school is the only possible means of benefiting the more mature workers who are ambitious to advance themselves. The majority of the workers who are employed in trades must be reached by evening schools, if at all.

Young people often neglect their opportunities. The desire for wages, pure indifference, and other causes induce many to go to work before they receive the advantages of an industrial education, even when it is offered, and to neglect, in many instances, the advantages of part-time schooling unless this is made compulsory by the States. The awakening which often comes after these chances are past leaves the evening school as the sole remaining hope.

So far as evening work for men, at least, is concerned, it is probable that the best immediate returns in increased economic efficiency from industrial or trade training come from instruction in the evening classes attended by adult workers. They have been in the shop long enough to realize their lack of preparation and its practical value; they have acquired sufficient skill and insight into mechanical processes to know what they need and come to the evening class determined to get it. The instruction, when given by a teacher who is himself familiar with the trade, can be made to appeal at every step to the interest and the previous knowledge and experience of the student.

At the present time the need for evening industrial and trade schools is probably at its greatest in this country. It will be used to bridge over the chasm which has resulted from the lack of industrial education in the past. While there will always be a place for the evening school to give many workers the training they need as the next step forward in their callings, a system of all-day and part-time industrial schools will greatly lessen this need. In Germany, as the result of 30 years of progress, they have been largely replaced by continuation schools, which are more and more becoming day schools. "The evening school may be an imperfect and temporary agency, but it is nevertheless the only agency to do a large part of the work which needs to be done."

The time available for vocational instruction in evening classes is so limited that it is impossible to teach both the theory and practice of a complete trade in an evening school. For this and other reasons it has been found by practical experience that productive wage earning can best be reached by a type of instruction which will give the learner help in solving the actual problems he meets in his daily work—courses which will help him forward a step at a time, as it were, in his mastery of that occupation. In giving instruction in evening classes to farmers, for example, such problems as the following might be taken up: Marketing farm products, selecting seed corn, keeping poultry, how to grow tomatoes, etc.

Experience has demonstrated that such short unit courses arranged to meet the specific and immediate needs of the workers provide the best means of giving the needed help. Such courses make it possible for a worker to come into the evening class, take one or more

courses and withdraw without interfering with the organization of the school. The work becomes more individual and interesting. Such unit courses may be 1 hour, 10 hours, or 50 hours in length. The following examples from representative occupations and trades will make clear what is meant:

Carpenters' Trade—
- Blue-print reading for carpenters.
- Free-hand drawing for carpenters.
- House framing.
- Roof framing.
- Stair building.
- Shop arithmetic for carpenters.

Machinists' Trade—
- Blue-print reading for machinists.
- Free-hand drawing for machinists.
- Automobile repairing.
- Bench lathe work.
- Tool making.
- Shop arithmetic for machinists.
- Forging.

Unit Courses in Cooking—
- Bread making.
- Cake making.
- Simple family meals.
- Left overs.
- Lunches for the dinner pail.
- Feeding of children.
- Marketing.

Unit Courses in Homemaking—
- Serving of meals.
- Home nursing.
- Care of children.
- Washing and ironing.

Millinery—
- Wire framing.
- Hat trimming.
- Velvet hats.

In contrast to the short unit course is the "long-term single-subject course," which is the course by which subjects have generally been presented in evening schools.

The long-term courses are primarily for those who know with a fair degree of accuracy what they want; for those who are not likely to become discouraged by a too early announcement of the length of time that will be required to reach the goal that they seek; and for those who have sufficient faith in what the school can do for them to make them willing to pay the price in sacrifice of both time and effort that is necessary to obtain the needed training.

These courses may follow a single subject or a single line of work over a considerable period with a large group of students; or they may start with the large group of men and later differentiate the work into several subdivisions with smaller groups. The work, too, may be so arranged as to permit students here and there throughout the course to supplement it with related study selected from other courses. The distinguishing feature of this course is its continuity for the individual student, and its successful operation is confined almost wholly to very large cities.

On the whole, short unit courses will be found to be the more satisfactory, permitting, as they do, greater flexibility of instruction, better adaptation to individual needs, and a variety of combination that will more nearly meet each student's individual requirements.

The establishment of any school or class giving preparation for any trade raises the question of the relation of the institution to the trade as a training center.

Inasmuch as any plans for vocational secondary education in a town or city must adjust themselves to present-day conditions in the industries, it is necessary to consider not only the processes and demands of the trades and occupations upon the worker, but also the attitude of both employers and employees in the trades as to the kinds of training needed, the ways in which the training can best be given, and what arrangements the employers, employees, and the schools shall agree upon as to the following:

1. The conditions under which new workers are to be trained and received into the trade or occupation.

2. The credit toward the period of apprenticeship to be given any course of training in the schools either before or after employment.

3. The training in schools as well as shops to be required of the apprentice after employment.

4. The preference given to local and trained workers in hiring and promoting in the trade or occupation.

In order to guard against misunderstandings and in order to prevent future complications and difficulties, it will in many instances be necessary to prepare a written bill of particulars which determine somewhat in detail the conditions under which the three most interested parties are willing to cooperate in carrying on the work of vocational education.

These particulars may make provision for such questions as—

1. The length of the probation period during which the pupil shall be tested out for determining his fitness to go on and complete the training necessary for entrance to the trade which he has selected.

2. The wages to be paid—

(*a*) During the period of part-time training.

(*b*) At the entrance into the industry on full time.

(*c*) Graduated scale of increase in wages up to time of acceptance as a full-fledged journeyman.

3. Deferred presentation of the diploma for a period after leaving the school and entrance into the industry to be dependent upon proof of satisfactory work.

4. Preferential employment to be extended to those who have attended day or evening classes for training the worker in trade subjects.

5. Length of time and content to be covered by the instruction in the school.

6. Possibilities and arrangements for instruction during dull-season periods.

7. Arrangements to be made by the trades for encouraging attendance upon evening trade-extension classes.

8. Any other matters which may be pertinent to the local situation.

Chapter VI.

METHODS OF GATHERING DATA ABOUT INDUSTRY AND INDUSTRIAL WORKERS.

In the recent past we have had a large number of industrial surveys or investigations the purpose of which has been to reveal in a very definite way, and susceptible to interpretation in educational terms, the value of instruction for those who are to enter upon industrial careers, or for workers who have already entered the industries.

The determination of many of our large industrial communities to take an inventory of their natural resources (meaning their aristocracy of brains) has disclosed the fact that the stock we had believed inexhaustible is somewhat depleted. It is believed that in the past Providence has been kind to us, but in the future Providence is likely to leave us a little more to our own intelligence, and henceforth we must sell more brains and less material.

An immediate determination to pursue the policy of our most successful competitor for industrial and commercial supremacy appears to be agreed upon, and likewise that the same end must be attained by the same means—that is, by industrial education.

It is apparent that there is no limit to the possibilities of human helpfulness that could be realized by the establishment of properly equipped and managed industrial schools. They would become the medium of communication and the promoters of cooperation between the commercial and industrial world and the school.

It is easy to understand why it is not a good thing for a community to have large numbers of boys and girls seeking employment while a reasonable minimum of education is still unattained, or entering upon life careers still too young to be aware of their own possibilities.

Just now we have one of the recurrent periods where the world is filled with reform, generally of the most attractive kind, which aims at making some one other than ourselves virtuous by certain due processes. There is all about us a widespread desire to elevate the moral or material condition of others. At the present moment it is industrial efficiency. All such propositions we must welcome for purposes of study. We must look upon them with attention and examine them, not merely in the roseate glow of enthusiastic hope, but

by the cold, clear light of the past, before we decide that they are fit for the ordeal of the future and will prove a benefit to mankind.

We must, to the utmost degree, develop our human efficiencies, but keep in mind always that social values are of greater importance than the productivity of units of trade. Devices for purposes of exploitation of the workers, reducing costs, and increasing output can not and will not be accepted as creators of social efficiency.

Vocational schools must undoubtedly yield, to a certain extent, to the demand for more specific preparation for the work of the world. On the other hand, it is equally certain that business and industry must yield to the demand for better adjustments to the physical, intellectual, and moral needs of the workers.

The chief difficulty in the recent past to the establishment of industrial schools has been (1) the lack of data regarding occupations and (2) the lack of that intimate relationship of cooperation between the shop and school so necessary to insure success. This intimacy of relationship must be permanently established and maintained if progressive efficiency is to be the goal.

Industrial education in any community, if it is to be efficient, must be at least as progressive as are the industries of that community, but the school authorities ought not to remain content to follow the industrial development of the community. Industrial education should not be content to follow, it should aim to direct industrial development. The data of industrial education include not only the data relating to the shops located in the community, and to the employments and processes of those shops, but include in addition data relating to the industry, data, that is to say, which are national and international in scope.

KIND OF FACTS TO BE GATHERED.

A systematic inquiry regarding occupations and processes in those industries which are established in the community, and with reference to which industrial courses in the public schools are organized, must be made in order that courses may be developed in conformity with the best practice in the industry.

The industrial character of a community is determined by a process of selective evolution. Indutries develop in any community in competition with other communities largely in proportion as the environment is favorable for development. This selective evolution may be a blind natural process, dependent upon unenlightened effort, or it may be the result of enlightened and directed effort. In either case the industrial character of the community will be unique and peculiar to that community. This does not, of course, mean that all of the occupations and industries of the community will

differ materially from the occupations and industries of other communities. It means that the degree of development of each industry will be determined by local conditions. It will certainly be determined in part by accident. Industries may develop in a community by virtue of the momentum of development in the past. An industry happens to be initiated in a community, and, simply by virtue of the fact it has been established, it develops unless there are unfavorable local conditions.

The important consideration is that the degree of development of the industries established, as is the case in every large city, whether determined by accident or by natural economic conditions, is unique and peculiar. Since it is unique and peculiar, the educational needs of a community can not be determined in any other way than by a survey which is organized to determine for that community precisely what is its own peculiar industrial character, and especially to determine in what respect its industrial character differs from that of other communities. The final object, therefore, is to define precisely the industrial character, to emphasize especially the qualities of industrial conditions, and to provide a basis for making industrial eduaction in the community as unique and peculiar as is the industry itself.

PRESENT INDUSTRIAL INEFFICIENCY.

Our present processes are inefficient and wasteful, and we suffer great loss from incomplete production, due to want of skill. We pay little or no attention to the human element in industry, and much less to the experimentation for correct standards. Men are assigned to this machine or that machine, to one process or another, and left to toil without any well-defined notion of how the volume of their output will balance with the output of other men operating other machines or engaged in other processes. There is little information at hand to indicate whether individual workmen are efficient or whether they are performing their tasks by the shortest possible cuts. Training for industrial efficiency, if it is realized that the human element must be considered, will make of every worker grounded in the science of industrial processes an experimenter for improved methods. It offers an opportunity for research into industrial processes that will make every worker a research student, instead of a devitalized and deenergized automaton.

One purpose of industrial education should be to teach the best usage and practice, as well as processes in the industry; in a word, to teach the industry to the community as well as to the youth who are to enter the industry. When an industry is following obsolete methods the purpose of industrial education should be to be aggressive in establishing modern methods and the most approved shop

practice, both as regards manufacturing processes, the organization of the working force, and the division of labor.

The present needs of industry, viewed from their economic aspects only, may be summarized in part as follows:

1. A greater investment of labor power and skill in the finished product.

2. A readjustment of relationship between employers and employees, which involves a cooperative effort by employers and employees for productive efficiency.

3. Relief of the workers from the deadening monotony of employment.

4. An educational system that will develop initiative, independence, imagination, and self-reliance.

AIM OF SURVEY.

The aim of any survey in part must be:

1. To prove the necessity of a knowledge of industrial and school conditions in the making of a program for industrial education in a municipality.

2. To show the kind of facts about industry and about the schools which need to be gathered.

3. To develop a proper method for studying the industries and the schools for the purposes of industrial education.

4. To give publicity to a knowledge of industrial and school facts and conditions which must be considered in the economic development of a permanent and constructive program of industrial education.

Since vocational education is a local issue, it must be adapted in its contents and method, as well as in its organization and administration, to the social, industrial, and educational conditions of the community.

Assuming that it is the business of the community to educate and equip for life all the youth of the city, it is also the business of the city to insure scientific guidance into useful vocations. It is just as important to assure the proper application of the training, through fitting the individual to the right occupation, as it is to provide the training itself. The public conscience is being awakened, and it will no longer do to leave boys and girls to the vicissitudes and moral dangers of chance employment, to the certain disappointment of a job without a future, or the handicap of exploitation by private enterprise. It is apparent that education and training, unsupplemented by opportunity for employment which assures the proper utilization of the training, is a tremendous economic waste.

SCOPE.

The scope of an industrial survey in order to be complete must include an analysis of the major portion of the mechanical and manufacturing industries, the building trades, transportation, heat, light, and power transmission.

METHODS.

A comprehensible survey must be the work of professionals, not of amateurs. It may be laid down as a fundamental principle that the successful achievement of any survey is conditional upon professional service. The preparation of schedules, the gathering of data, the tabulation work, and the final editing and organizing of the material for the report require professional service.

The work is of a special character, requiring a special sort of training and experience. Efficiency as a survey investigator is not primarily a matter of natural ability. It may be freely admitted that in any community there are connected with the public schools a sufficient number of men and women entirely competent, so far as regards natural ability to make a survey, but it is highly improbable that there should be available in any community a group of men and women possessed of the special training and experience required by survey work. In the nature of the case no community can maintain a group of survey experts, since no community has yet adopted the policy of making a survey at frequent intervals.

In this connection, however, it may be noted that something in the nature of a permanent survey organization should be maintained by every industrial community, and one purpose of every initial general survey should be to develop a local organization for the maintenance of a permanent survey.

The objects of such a permanent survey are obvious. They are: First, to extend investigations to industries not covered by the initial survey; second, to gather regularly each year, by a systematic inquiry, data regarding new processes and occupations instituted within those industries which are established in the community, and with reference to which industrial courses in the public schools are organized; third, to gather data regarding the development of new industries in the community; fourth, to maintain intimate relationship of cooperation between the shop and the school.

This intimacy of relationship can not be permanently established by one general survey made at any given time, or even by a succession of general surveys made at more or less infrequent intervals. It can be maintained only by a permanent local organization, which shall be constantly employed in gathering new data in the shop.

SCHEDULES.

The information concerning trade groups and occupations is secured through two types of schedules: (1) The establishment schedule and (2) the individual schedule.

(1) The establishment schedule, secured from employers, covers the following important points:

Products of the different establishments.
Busy and slack seasons in the industries.
Difficulties in securing competent workers in specific occupations, with reasons.
Period of minimum productivity in various occupations.
Years of experience necessary to reach minimum wage.
Probable increase and decrease in demand for workers.
Relative demand and supply for skilled and unskilled labor.
Frequency and line of promotion from occupation to occupation.
Shifting of workers from process to process to give wider experience and training.
Opportunities for untrained beginners in specific occupations.
Relative efficiency of foreign and domestic trained workers.
Relative instability of employment of trained and untrained workers.
Conditions affecting the welfare of the worker.
Character of instruction received by workers in the shops.
Relative advantage of indentured and unindentured apprenticeship.
Character of apprenticeship agreements.
Relation of general school training to efficiency.
Extent of the educational deficiencies of beginners.
Types of schools and kind of training necessary in the judgment of employers to increase the efficiency of workers.
Willingness of employers to cooperate in part-time schooling.
Kind of part-time schooling favored.
Practical tests used in determining the efficiency of applicants and workers.

The following "establishment schedule," used in the Richmond survey of 1914, illustrates more fully the scope of this type of schedule:

*Name of firm*_____
*Date*_____

VOCATIONAL SURVEY OF RICHMOND, VA.

[NOTE.—All information furnished in this questionnaire will be held strictly confidential and used only for the purpose of determining the kind of industrial education which will best meet the needs of persons engaged in the specified trades of Richmond, Va.]

[INSTRUCTIONS.—Please fill in all blanks and return as soon as possible to Charles H. Winslow, director vocational survey, Administration Building, 805 East Marshall Street. Where space for reply is insufficient, please give information on separate sheets by referring to the number of question answered.]

Name of person to whom future inquiries may be addressed: _____.

PART I.—*General information.*

1. What are your specialties? _____
2. Number of employees other than office help:
   (*a*) At present time _____
   (*b*) Maximum number in service in 1913 _____
   (*c*) Minimum number in service in 1913 _____

3. What is the slack season with you? From _____ to _____
4. What is the busy season with you? From _____ to _____
5. Is difficulty experienced in obtaining efficient journeymen workmen for permanent employment? _____
   (*a*) Is so, in what occupations? _____
   (*b*) Is this difficulty due to—
      (1) Lack of an apprenticeship system in the shop? _____
      (2) Lack of opportunity to learn the trade in the shop? _____
      (3) Other causes? (Specify.) _____
6. What is the age period of maximum productivity for workers? (Indicate age at which the journeyman commonly begins to earn full wage, and age at which earning power begins to decline.)
   From age _____ years, to age _____ years. Are there exceptional occupations to which the age limits specified do not apply? If so, indicate the limits for these exceptional occupations. _____
7. After how many years' experience as an apprentice and journeyman does a journeyman ordinarily earn his maximum wage? _____
8. In what occupations is the demand for more workers likely to increase most rapidly during the next five years? _____ (Explain why.) _____
9. Is the supply of unskilled labor becoming greater or less, relatively to the demand for it? _____ The supply of skilled labor? _____ Why? _____
10. Are promotions frequently made in your establishment from one occupation to another? _____
11. What is the usual line of promotion for a journeyman? _____
12. Are individual workmen frequently shifted from one process, or machine, or occupation to another? _____
13. What trades can a boy learn in your shop thoroughly? _____
14. Can untrained beginners be used? _____ In what occupations can they be used? _____
15. Is the foreign-trained worker a better workman? If so, why? (Is it, for example, due to superior natural ability, or to better training in school, or in shop?) _____
    What are the deficiencies of the native Americans? _____
16. Can you retain thoroughly trained efficient workmen permanently in your employ, or do you find it necessary to lay off such men at certain seasons? _____

PART II.—*Conditions under which the work is performed.*

[In answering questions 17 to 24 specify in each case occupations and conditions.]

17. What conditions involve peculiar physical training? (Specify jobs and conditions.) _____
18. What conditions involve peculiar nervous strain? (Specify jobs and conditions.) _____
19. What conditions tend to impair health? (Specify jobs and conditions.) _____
20. What conditions especially stimulate the intelligence of the workers? (Specify jobs and conditions.) _____
21. What conditions, if any, narrow and restrict the mental development of the worker? (Specify jobs and conditions.) _____
22. What conditions tend to kill out the worker's ambition and interest in his trade? (Specify jobs and conditions.) _____

23. What conditions, if any, are to be guarded against as exerting morally unwholesome influences? (Specify jobs and conditions.) _____
24. What other conditions of work are important as affecting the welfare of the workers? (Specify jobs and conditions.) _____

PART III.—*How workers are trained.*

25. Does the worker receive any instruction or training in your establishment more than he can pick up on the job? _____ If so, who gives it to him? (Indicate nature of training.) _____
26. What occupations in your shop can be learned in the shop with little or no instruction? _____
27. What are the terms of any agreement of apprenticeship under which apprentices are now working in your shop? (If possible, provide copies of such agreements.) _____
28. Do you find that those who are apprenticed have a better attitude toward their work than those who are not? (Specify advantages and disadvantages of formal apprenticeship.) _____

PART IV.—*Relation of occupation to school training.*

29. In what ways have you found the industry hampered by a lack of elementary school education on the part of beginners? _____
What knowledge that beginners should have is most frequently lacking? (Specify occupations and deficiencies in detail.) _____
30. In what occupations, if any, is general school training beyond the seventh grade of value in increasing efficiency as workers? _____
31. Assuming that school training beyond the seventh grade is an advantage, what subjects should be taught? _____
32. What kind of a school would most help workers in the various occupations during the apprenticeship period? _____
Day schools _____
Part-time day schools _____
Night schools _____
Other schools (specify) _____
For which occupations do you believe that such schools could be provided to best advantage? _____
In your opinion, what should be taught in such a school? _____
33. If a part-time day school were established, would you as an employer be willing to enter into an agreement providing for a definite period of attendance of apprentices at such a school for a definite number of hours each week, paying them the usual wage while in school? _____
34. For what occupations would you enter into such an agreement? _____
35. If a part-time day school were established, in your opinion how many hours per week should an apprentice attend? _____
36. In your opinion, what should the schools do for the worker before he enters the shop? (Consider what amount of general education the school should give, what amount of vocational or industrial training, etc., and in general what the schools should give that is needed in the shop but can not be acquired in the shop.) _____
37. What do you believe a night school should teach to help the journeyman who wants to advance in his trade? _____
38. What questions do you ask applicants for work? _____

39. What tests do you apply to determine fitness or efficiency of applicants? ----------

40. What records are kept in your shop to determine efficiency of workmen? ----------

41. How can the worker be given an interest in his work? Can you suggest a modification of conditions in the shop or in shop practice or in school training? ----------

42. Would you be willing to cooperate with the schools in an effort to organize shop practice so as to develop interest and efficiency on the part of the worker? ----------

(2) The individual schedules, obtained from the workers, cover such important points as:

Age distribution of apprentices and workers and the nativity of the workers, by trades.

The regular hours of daily and weekly labor, by trades.

Time lost by workers, by trades.

Causes of loss of time.

Extent of fluctuation of employment, by trades.

Extent of overtime worked, by trades.

Years of experience as wage earners of workers.

Years of experience in present occupation and in other occupations.

Age of entrance upon wage-earning occupations, by trades.

Period of apprenticeships served in years by workers in different trades.

Relation of years of experience to hourly wage.

Change of place of employment during apprenticeship, by trades, and reason for changing.

Extent to which workers receive proper instruction in the shop while learning the trade.

Highest, lowest, and average wages, by occupations within trades.

Locality in which workers learned trades.

Change of occupations of present workers, by trades.

Misfits in present position by trades as to natural ability, training, and experience.

Employees working under conditions causing strain or impairing health, through occupational disease.

Possibilities of learning different trades completely in the shop.

Age of leaving school of apprentices and workers.

Hourly and weekly wages of apprentices and workers, by trades.

The following, taken also from the Richmond Survey, illustrates the extent of the "individual schedule":

INDUSTRIAL SURVEY OF RICHMOND, VA.

INDIVIDUAL SCHEDULE.

[NOTE.—All information furnished on this card will be held strictly confidential and used only to determine what kind of industrial education will best meet the needs of persons engaged in the industries of Richmond.]

Name ----------

1. Age ------ years.

2. Place of birth: (a) City ---------- (b) State ---------- (c) Country ----------

3. Occupation _____
4. Member of what union? _____
5. Name of employer _____
6. (a) Regular number of hours of labor per day (except Saturday)? _____ (b) On Saturday? _____ (c) Total per week? _____
7. (a) Wage per hour? _____ (b) Overtime wage per hour? _____ (c) Wage per week, not including overtime? _____

[NOTE.—Pieceworkers should give approximate estimate of earnings, and state "piecework."]

8. How many weeks of work did you lose during the year ended June 1, 1914, through:

[NOTE.—Estimate number of weeks where you can not give exact number.]

(a) Sickness, _____ weeks. (b) Accident, _____ weeks. (c) Factory shut down, _____ weeks. (d) Temporarily laid off, _____ weeks. (e) _____ weeks. (f) Total time lost, _____ weeks.

9. If you were on part time during any portion of the year, how many weeks? _____ (b) How many weeks overtime? _____
10. How many years have you been in your present trade, including apprenticeship? _____ years.
11. How many years did you serve as an apprentice? _____ years.
12. At what age did you begin to learn your trade? _____
13. (a) Name of city in which you learned your trade? _____ (b) In how many shops were you employed during your apprenticeship? _____ (c) What were your reasons for changing your place of employment? _____
14. (a) Is your present occupation one for which you feel that your training, experience, and ability best fit you? _____ (b) If not, specify occupation for which you are better fitted _____
15. (a) If you had had opportunities for suitable training, do you feel that you would have been more successful in some other occupation? _____ (b) If so, in what occupation? _____
16. Does your work involve peculiar physical or nervous strain? _____ (Specify in detail the nature and consequences of such strain.) _____
17. Are there conditions of your work which tend to impair health? _____ (Specify in detail.) _____

18. Mention below the different occupations at which you have worked. (Specify names of occupations.)	Length of employment in occupation.	Occupations (continued).	Length of employment in occupation.
(a) Present occupation		(g) Occupation before that	
(b) Occupation before that		(h) Occupation before that	
(c) Occupation before that		(i) Occupation before that	
(d) Occupation before that		(j) Occupation before that	
(e) Occupation before that		(k) Occupation before that	
(f) Occupation before that		(l) Occupation before that	

19. Check (—) those qualities most essential to success in your trade:
(a) Mental alertness. _____ (b) Special adaptability. _____ (c) Initiative. _____ (d) Accuracy. _____ (e) Patience. _____ (f) Strength. _____ (g) Endurance. _____ (h) Keenness of sight. _____ (i) Dexterity. _____ (j) _____
20. (a) While learning your trade did you receive proper help and instruction? _____ (b) What kind of help or instruction that you should have received was not given? (Specify any difficulties encountered by you in learning your trade.) _____

21. Can a boy learn your trade thoroughly in the shop? ------
22. At what age did you leave school? ------
23. What grade did you complete? ------
24. In what ways, if at all, have you found yourself hampered by a lack of knowledge or of school training? ------
25. Indicate below any school courses, including correspondence courses, taken since leaving school:

Name of school.	Kind of school.	Course taken.	Did you complete this course?	Who paid the tuition?	Cost.

26. Why did you take these courses? (Specify reasons for each course.) ------
27. Did this school work result in increase of wages? (State, if possible, amount of increase in wages due to this work.) ------
28. What other benefits did you receive from these courses? ------
29. In your opinion, what should the schools teach to help the worker before he begins to learn your trade? ------
30. What do you think a part-time school should teach a beginner during his apprenticeship? ------
31. What could an evening school teach to help you in your occupation? ------

TABULAR ANALYSES.

Tabular analyses of occupations or operations by industries or trade groups.—The purpose of this character of analysis is to present in brief summaries a description of each occupation or operation for immediate visualizations, which will show the characteristics of the occupations or operations in comparative form. Each such tabulation presents the analysis under two general heads—"Findings about occupations or operations in the industry" and "Findings about education for occupations or operations in the industry."

The method of gathering material for the above analyses is by visitation to shops and factories to study at first hand industrial processes and conditions and secure the schedule information. This method purposes also to explain to employers and employees the nature of the inquiry and to secure their cooperation. Each interview represents a personal conference (which is of a strictly confidential nature in so far as the individual is concerned) of about 20 minutes for the purpose of filling out the scheduled questions.

The following analysis of painting as used in the Richmond survey is an illustration of the "tabular analysis."

FINDINGS ABOUT THE TRADE.

PAINTING.

1. Process: Smoothing and cleaning new surfaces with sandpaper and duster; removing old finishes by burning and scraping, or with paint or varnish solvents. Where the surface is to be painted a priming coat is laid on, all imperfections in the surface filled with putty, and the final coats laid on, each being rubbed down. Where the surface is to be stained and varnished, the stain is applied, the pores of the wood filled, and the several coats of varnish flowed on and rubbed down. Other processes performed by the painter are graining, lettering, stenciling, gold lettering on glass, and calcimining.
2. Product or specialties: Inside and outside painting and decorating; sign, wagon, carriage, automobile, coach, implement, and furniture painting.
3. Importance of trade (number employed): Approximately 600.
4. Conditions of employment:
   (a) That involve physical or nervous strain: Close, long-continued application to fine work, such as coach painting, lettering, striping, and interior decorating.
   (b) That stimulate intelligence and interest: Inside painting and decorating, sign painting, lettering, and high-class finishing.
   (c) That narrow or restrict mental development: Rough outside work or constant exterior painting.
   (d) That are in other respects important as affecting the welfare of workers (i. e., liability to accident, occupational diseases): Danger from imperfect scaffold rigging; danger of lead poisoning from uncleanly habits and dry methods of sandpapering; chronic diseases are caused by the use of some quick-drying flat paints in poorly ventilated spaces.
5. Wages:
   Apprentices—
   (a) Beginning wage, $3 to $4 per week.
   (b) Second-year wage, $5 per week.
   (c) Third-year wage, $6 to $7 per week.
   (d) Fourth-year wage, $7 to $9 per week.
   Journeymen—
   (e) Minimum wage, $1.50 per day.
   (f) Maximum wage, $3 to $5 per day.
   (g) Union scale, $3 per day.
6. Hours of labor, regular per day; per week; on Saturday: 8 to 9 hours per day; 48 to 54 hours per week; 8 to 9 hours on Saturday.
7. Seasonal activity:
   (a) Busy season: March to December, inclusive.
   (b) Slack season: January and February.
   (c) Fluctuation in employment: Regulated somewhat by building activities, but men work on the average about 10 months in the year.
8. Extent to which the trade is organized: About one-tenth.
9. Entrance age: 16 to 18 years.
10. Years required to learn the trade: Four years.
11. Age of maximum productivity: 22 to 55 years.
12. Is the supply of labor adequate to meet the demand? (Cause of deficiency, if any): Supply adequate for present demand for medium-grade workers, but the supply of high-class workmen is not sufficient to meet the demand.

13. Is the demand for labor increasing or decreasing? Increasing, especially for efficient skilled workers.
14. What is the source of supply? Boys from the lower grammar grades and casual labor.

FINDINGS ABOUT EDUCATION FOR THE TRADE.

15. What does the worker need to properly equip him for the trade?
    (a) General education: At least a complete grammar-school education.
    (b) Trade and technical education: Instruction as to proper rigging of scaffolds; how to keep brushes clean; proper method of spreading colors; neatness in application of colors, especially on inside decorating and lettering; theory and history of the trade; color harmony and design; chemistry of colors and color mixing; mechanical and architectural drawing; sketching; estimating; hygiene of the trade.
    (c) Manipulative skill: Dexterity in handling brushes in fine decorating and lettering.
    (d) Other requirements; qualities essential; such as accuracy, etc.: Artistic sense in decorative work; accurate color sense in matching colors; special adaptability; initiative; accuracy; patience; endurance; keenness of sight.
16. What the industry gives—
    (a) Conditions of apprenticeship: Apprenticeship period of four years.
    (b) Provision made in shops for systematic instruction of apprentices: None.
    (c) Trade and technical knowledge: Only enough trade knowledge to equip worker for immediate productivity.
    (d) Manipulative skill: Dexterity in handling brush.
    (e) Extent to which trade can be learned in the shop: The trade knowledge required to make the labor productive can be acquired in practice, but very little of the technical knowledge or of the hygiene of the occupation can be so gained.
    (f) Provision made in shops for systematic instruction of journeymen: None.
    (g) Line of promotion: Apprentice, journeyman, foreman, contractor, employer.
17. Common deficiencies of workers: Deficiency in general education, technical knowledge, and knowledge of hygiene of the trade.
18. I. What the school ought to give the worker before entering the shop: Complete grammar-school education; prevocational courses in free-hand drawing; courses in color harmony and design.
    II. What the school ought to give the worker after entering the shop—
        (a) Trade and technical knowledge: Specialized courses covering specific trade and technical requirements of painting.
        (b) Manipulative skill: The school should provide opportunity for acquiring manipulative skill in special lines of work, such as lettering.
    III. Nature of part-time courses needed: Hygiene of the trade; chemistry of trade; color harmony; design; reading of blue prints; mechanical, architectural, and free-hand drawing; estimating.
    IV. Nature of evening-school courses needed: Same as III for apprentices. Advanced special trade courses for journeymen.

DESCRIPTIVE ANALYSES.

Descriptive analyses of occupations, a description of each of the occupations within a trade group, or a description of the operations in productive processes is then prepared, which explains these processes and should include the physical, hygienic, and economic conditions of the work, the requirements upon the workers, and the kind of schooling required.

TYPE ANALYSES FROM THE RICHMOND SURVEY.

PAINTING.

Processes.—The painter performs a variety of operations, some of which are only indirectly or remotely related to the work of laying on coats of oil paint, varnish, water color, stain, or kalsomine. These operations may be characterized briefly as follows: Preparation of wood, plaster, and metal surfaces to receive the finishing coats; removal of old finishes; preparation and mixing of spirit or oil vehicles, and lead, zinc, and color pigments; rubbing down coats; and in certain classes of work, graining, laying gold leaf, gilding, lettering, free-hand drawing, stenciling, rigging scaffolds, and setting glass with putty or moldings in windows, doors, and skylights constructed of wood, metal or stone. These processes, which must be performed under a variety of conditions—in the paint shop, in manufacturing plants of miscellaneous character, or on the outside or inside of dwellings or other buildings—can best be considered with reference to each of the several classes of work which the all-round painter must be prepared to undertake.

House painting.—House painters may be divided into two classes, namely, brush hands, who do only rough outside work, and whose only trade qualification is ability to cover extensive surfaces; and skilled artisans, who understand the mixing of paints and can do any sort of inside or outside work.

The first step in house painting, as in other painting, is preparation of the surface to be covered. In new work this consists in cleaning and smoothing the surface with sandpaper and duster. In old work the first step is removal of old finishing coats of paint or varnish, which is commonly done by burning with a Bunsen burner and scraping, or by applying paint or varnish solvents and scraping. Surfaces from which old finishes have been removed must then be sandpapered until perfectly smooth. When the wood has been laid bare, smoothed, and cleaned it is ready for the priming coat of white lead, ocher, or other pigments mixed with linseed oil to the proper consistency. The color is selected for the priming coat with reference to the color of the coats that are to follow.

The priming coat is worked well into cracks and nail holes to protect these broken surfaces and is allowed to dry, after which cracks and holes are filled with putty, which adheres well to the paint. Two or more coats of the required color are now applied, the number and composition of the final coats depending upon the class of work.

A detailed description of several processes undertaken in various fields of painting follows the general description of house painting. These processes are known to the trade as *staining*, *filling*, *varnishing*, *kalsomining*, *sign painting*, *gold lettering on glass*, and *graining*,

These are in turn followed by a description of the specific problem in painting, that of *railroad car painting*. While it is recognized that this particular description may not fit conditions in other communities, it is given emphasis here for the purpose of showing the necessity of detailed description of processes if the industry is to be properly studied for the purpose of finding out what types of vocational education are needed in connection with a given industry:

Railroad car painting.—In Richmond railway car painting constitutes a branch of the trade of sufficient importance to warrant separate treatment.

Car painting is classified under two distinct heads, i. e., passenger car and freight car painting. Passenger car painting is a very high grade of work, requiring much experience and skill in all the processes of painting, varnishing, and finishing, while freight car work can be done by any ordinary painter, since no special skill is required for this work of painting of freight car bodies and trucks.

Passenger-car painting may be subdivided as follows: Exterior painting of new cars, interior finishing, and refinishing of old cars.

New cars when brought into the shop are first rubbed down with coarse and then with fine sandpaper. After this is done the wood filler is applied, the filler being a pigment mixed with oil and turpentine to the consistency of a thick cream.

After the coat of filler come three coats of body color, each one being rubbed down with pumice stone and water. The exterior decorations, such as lettering and striping, are then applied and the entire car revarnished.

In interior finishing the new interior woodwork is rubbed down with sandpaper and a coat of clear shellac applied. This forms a foundation for the three coats of varnish which follow. The interior varnish coats are each smoothed by rubbing with pulverized pumice stone and water.

The first process in refinishing old cars is the removal of all old paint by heating it with the flames from a Bunsen burner, gasoline being mostly used for this purpose. This having been done, the entire car is rescraped, scrubbed down with water, and sandpapered. Wood filler is not applied to old work, as the pores of the wood are already filled. Each body coat is rubbed down with pumice and water and the decorations and varnish applied, as in the case of new cars.

It requires about six days to paint a car completely, much of this time being, of course, consumed in allowing the several coats of paint and varnish to dry.

All window and door glass is put in in the car shop, although this work does not come directly under the supervision of the foreman of the paint shop and is not done by the car painters.

With the introduction of steel cars by railway companies a new method of applying paint has been found. This method consists of spraying paint upon the surface with a spraying machine. At the present writing this method has not been introduced in Richmond, all of the paint being applied by hand.

The steel-car painting done in Richmond is all repainting and refinishing. The car is given five or six coats of a body color, each coat being rubbed down with pumice and then decorated and varnished.

Freight car and truck painting requires no special comment, as this is the most common form of painting done in the car shop and does not differ from other rough painting.

Product or specialties.—The work of the painter in Richmond is not materially different from that done by painters in other communities, although

railway car painting may be designed as a line of work employing a considerable number of men. In general the work of the trade embraces inside and outside painting of buildings; decorating; sign painting; painting of wagons, carriages, automobiles, steam and street railway coaches; painting of bridges, tanks and structural ironwork, of agricultural implements, and of furniture.

Importance of the trade.—According to the Federal census of 1910 there were in Richmond in that year 543 painters, glaziers, and varnishers, of whom 447 were employed in the building trades and 96 in factories. Of the painters in the buildings trades, 421 were white and 26 were colored. The number of painters in the city at the present time is estimated to be approximately 600.

Conditions of employment.—The work of the painter is not generally such as involves any peculiar physical or nervous strain beyond that involved in any sort of manual labor. Moreover, the work of the all-round well-trained painter is sufficiently varied to stimulate interest, much of it requiring the exercise of high-grade skill and of artistic sense. In some Richmond shops, however, the work is to a very considerable extent specialized, one man doing the rough work of burning and scraping off old finish, sandpapering and putting on body coats, another filling, staining, and varnishing, and another striping and lettering. In house painting, also, one set of men may be employed entirely on rough work. For the relatively unskilled men who are kept on the rough work there is comparatively little in the occupation that is stimulative, although there is in some cases a chance of promotion to the finer work of inside painting and decorating, sign painting, lettering, and finishing. In some classes of work there is danger of accident from imperfect construction or rigging of scaffolds.

Hygiene of the occupation.—The condition of employment which most seriously involves the welfare of the painter is that which exposes him to the danger of poisoning. It has been scientifically demonstrated that many of the materials with which the painter works are poisonous, and it is true that many of the processes are such that it is difficult, especially under certain conditions, to avoid infection. There are, however, certain simple precautions by which much of the danger can be avoided. A brief summary of the findings of scientific investigations and of the present survey as regards the hygiene of the trade follows. In general it may be said that the returns on the schedules of the survey, and the information gathered in personal conferences with painters, are entirely consistent with the findings of scientific research as regards the injurious effects which follow the use of certain materials, and which result from carelessness or improper procedure in various lines of work.[1]

Either or both the pigment and the vehicle of paint may be poisonous and either or both may be perfectly harmless. The higher-priced paint usually contains white lead, linseed oil, and turpentine. Both the white lead and the turpentine are poisonous. The pigment in cheap paint may be something perfectly harmless, as chalk or barytes, while the vehicle may contain so great a percentage of petroleum compounds that it is extremely poisonous, especially when used on inside work in inclosures poorly ventilated.

The pigments which cause poisoning are the lead salts, white lead, or basic carbonate of lead, sublimed white lead or basic lead sulphate, chrome yellow or yellow chromate, chrome green (a mixture of chrome yellow with Prussian blue), red lead, and orange mineral. Lead carbonate and lead sulphate are used in the higher-priced paints, usually separately, but sometimes together,

[1] As regards the nature and physiological effects of paint and varnish poisons the following text is largely summarized from Bulletin No. 120, U. S. Dept. of Labor, by A. J. Carlson and A. Woeful.

and the carbonate much more commonly than the sulphate. Chrome yellow is used for tinting in house painting and in coach painting; chrome green for painting window shutters; red lead in painting structural ironwork; and orange mineral for painting wagons.

Of these constituents lead carbonate is considered the most poisonous; but when sandpapering, mixing, or chipping off old paint, the red lead is the most dangerous, because it is lighter and floats in the air more easily. Chrome yellow is considered to be about as harmful as the red lead. Lead sulphate is not as dangerous as the lead carbonate, red lead, or the chrome yellow. It has been determined by scientific experiment that in human gastric juice the lead carbonate is a little more than twice as soluble as the sulphate; that the lead carbonate is distinctly more toxic than the sulphate; that both produce acute lead poisoning.

Experiments conducted to determine the effect which milk, when combined with the gastric juice, has upon the amount of lead dissolved brought the conclusion that when the milk and gastric juice are in equal proportion the hydrochloric acid of the gastric juice is so completely fixed by the milk proteins, or neutralized by the carbonates in the milk, that the mixture has virtually no solvent action on the lead salts.

On the basis of scientific investigations three practical suggestions have been made for safeguarding painters against poisoning: (1) That since lead carbonate is so much more toxic than the lead sulphate, lead workers as well as the State shall aim at the elimination of the use of the carbonate in all the industries where this is possible; (2) that since basic lead sulphate, or sublimed lead is poisonous, none of the precautions usually advocated for the protection of workers in lead be neglected by those handling lead sulphate; (3) that, in addition to taking other important prophylactic measures, workers in lead salts should drink a glass of milk between meals (say at 10 a. m. and 4 p. m.) in order to diminish the chances that the lead they have swallowed be dissolved by free hydrochloric acid of the gastric juice, as in some persons there is considerable secretion of gastric juice in the empty stomach.

Dust from the sandpapering of lead-painted surfaces is one of the most important causes of lead poisoning. The dust thus raised is inhaled and lodges on the nasal and pharyngeal mucous membrane and is then swallowed. Investigation has shown that the great bulk of this dust finds its way into the stomach and not to the lungs. This causes the poisoning of the workman, as the lead in the dust is dissolved by the free hydrochloric acid in the gastric juice and is easily absorbed. This dust is dangerous not only to the man doing the sandpapering, but also to the others working near. The danger can be entirely eliminated by the use of pumice stone and water in rubbing down coats, or, if it is a first coat where this is apt to raise the grain or on metal where it may cause rust, by moistening the sandpaper with some cheap mineral oil. Sandpaper so oiled lasts as well as when used dry, and the results so far as the work is concerned are as good when oiled paper is used as in dry sandpapering.

When metal surfaces are to be repainted they are usually chipped clean, and often the work is done by a machine using compressed air. This work is very dangerous, and a much better way, whether on wood or metal, is to burn the paint, causing it to curl and shrivel up, after which it can be easily scraped off. Some authorities speak of lead poisoning being acquired by the use of the burning method; but this is not apt to happen unless the painter should hold the flame long in one place and thus cause considerable smoke which might carry mechanically small particles of lead. The boiling point of lead is so high that the danger from evaporation from the heating required is very slight. Danger of poisoning from this method arises, however, when the burned paint is allowed

to lie upon the floor of the shop until ground to dust. This dust is stirred up by the feet of the workmen or by moving materials, and is constantly inhaled and swallowed by the workmen. The scraps of paint should in every instance be cleaned up before they become dry.

The painter should be extremely careful in handling his food or tobacco and should avoid wearing dusty and paint-soaked clothing.

The dangerous vehicles are turpentine, benzine, naphtha, benzol, wood alcohol, and amyl acetate. Turpentine used as a dryer and for thinning is a constituent of many paints and varnishes. It sometimes makes up the entire vehicle. The inhaling of much turpentine-laden air causes headache, dizziness, and irritation of the throat and of the urinary system. If the workman is exposed for long periods to turpentine fumes, it often causes chronic inflammation of the bladder and kidneys. These fumes cause also inflammation of the skin and often affect the nervous system, as is evident in the typical symptoms of staggering and in extreme cases loss of consciousness.

Benzine and naphtha are used in hard oils as driers and very often constitute a large percentage of the vehicle in cheap quick-drying paints. Fumes from these liquids affect the nervous system much as does alcohol, causing staggering, defects of memory, and disturbance of sight and of hearing. Where the workman is long exposed to these fumes, chronic poisoning takes place, causing skin diseases, weakness, nervousness, and sometimes even impaired mentality.

Benzol is used in priming and as a paint and varnish remover because of its penetrating and solvent qualities. The benzol fumes are very dangerous and may be fatal. They cause changes in the blood, hemorrhages of the organs and mucous membranes, and degeneration of the organs. The symptoms of this poisoning are a flushed face, dizziness, and headache, followed by a blue appearance of the skin, nervous excitement, or stupor accompanied by sickness. If the poisoning is chronic, ulcers appear on the gums and lips.

Wood-alcohol poisoning comes mostly from inhaling the fumes while using varnish. This causes headache, hoarseness, twitching of the muscles, weak heart, unconsciousness, and temporary or permanent impairment of sight even to the point of complete blindness.

Amyl acetate, derived from fusel oil and acetic acid, is used in varnishes, gilding fluids, and as a paint solvent. The fumes cause headache, uncertain movements, difficulty in breathing, sleepiness, bad heart action, and poor digestion.

Poisoning from the various paint vehicles may be avoided in most cases by insuring good ventilation, either natural or artificial, of shops or rooms where work is being done. When this is not possible, the men should be changed as often as possible on work, so that no one of them will become enough poisoned for permanent injury.

Although the vehicles in the various leadless paints are usually much more poisonous than those used in lead paint, the introduction of these paints into the industry is a great help toward the betterment of hygienic conditions in the trade, as it is much easier to avoid poisoning from the vehicle than it is from the various lead pigments in the paint.

It may be noted that the paints used in railway-car painting are almost entirely the new leadless or almost leadless kind. The smoothing of all paint surfaces is done either by the use of pumice-stone and water or with oiled emery cloth or sandpaper. All paint is removed by burning and scraping, and the work is done in large open buildings, where the ventilation is such that there is very little, if any, danger from the volatile substances in the paint. Railway-car

painting in Richmond is therefore to a very large extent free from the dangers of poisoning above cited.

Economic conditions.—House and sign painters are to a very considerable extent free lances, working first for one contractor and then for another, or independently on their own account. The character of the work done by them varies greatly from job to job, and partly because of the miscellaneous character of their work and partly because of the nature of the climate in Richmond employment is not markedly seasonal. The slack season is from the 1st of January to the end of February, and the men are employed on the average about 10 months during the year. The sign painter, when weather does not permit outside work, usually has on hand work which can be done in the shop. As regards painters in the car shops and in manufacturing plants, employment is generally steady, and the seasonal fluctuations inconsiderable. Hours of labor range from 8 to 9 hours per day, or 48 to 54 hours per week, full time being worked on Saturdays. Skilled journeymen earn $3 per day, the minimum wage for unskilled labor being $1.50. Wages are low as compared with wages paid in other trades. The trade is about 10 per cent organized.

Age period of productivity.—Boys enter the trade between the ages of 16 and 18 years, and serve a four years' apprenticeship. The age period designated as the period of maximum productivity is from 22 to 55 years.

Demand for labor.—House painting is a field in which the demand for labor is increasing, but the occupation is, nevertheless, somewhat overcrowded, especially with semiskilled workers. The demand for sign painters is increasing, and there is a scarcity of skilled high-grade workmen. In the car shops and in manufacturing plants the demand for labor is fairly stationary. In general, the supply of medium-grade labor seems adequate for the present demand; the supply of high-grade labor is insufficient to meet the increasing demand in special lines. Workers are recruited from the lower grammar grades and from casual labor.

Educational trade and technical requirements.—In the way of general education the occupation of the painter makes no special demand upon the worker beyond that degree of general education required for all workers to insure to them advancement in proportion as they acquire in practice trade and technical excellence.

The trade and technical knowledge required by the skilled artisan is, however, very considerable. The nature of this knowledge will be apparent from the foregoing account of the processes and hygiene of the occupation. Some trade knowledge pertains even to the simplest processes, as, for example, to the process of rubbing down surfaces, where sandpaper of a proper grade of fineness must be selected, or some other material, such as ground pumice stone, rotten stone, fine steel wool, or curled hair. The painter must know which of the many varieties of fillers, sizes, or foundations should be used on woods of different qualities and in different classes of work. He must know something of the preservative qualities of different finishes. He must know how to mix oils, pigments, and varnishes for body coats, for flat and for glass finishes, for inside and for outside work. In all color work he must have a knowledge of color mixing and harmony.

The degree of manipulative skill required by the painter varies from the small amount required to lay on rough body coats to the very considerable amount required for flowing on varnishes, and for the fine work of striping, lettering, and decorating. The characteristic tool of the painter is the brush, which varies from the small round pencils and sash tools of camel's hair to the large round or flat brushes of hog bristles. In the handling of these tools a very high degree

of manipulative skill is required for certain classes of work. In all classes of work the skilled hand economizes time, labor, and material.

In addition to the above qualifications, the painter should possess an accurate color sense, an artistic sense, which will enable him to harmonize colors in inside decorating, and to do original work in designing; a knowledge of alphabets for lettering, and a natural talent and skill in freehand drawing. Finally, it is vitally important that the painter shall have a thorough knowledge of the hygiene of his occupation.

What the industry gives.—The workers in the skilled class enter the trade through an apprenticeship, usually of four years. During these four years the apprentice is occupied as follows. In the first year he helps by running errands and cleaning brushes, and picks up such information as he can from observing the workmen; he learns to mix paints and to rig scaffolds; he does inside and outside painting, and learns to remove stains by the use of lime and acids. In his second year the apprentice is put on the scaffold and works with the journeymen putting on finishing coats; he learns how to remove old finish by burning and scraping, or by the use of solvents, and how to prepare work for new finish. In his third year the apprentice is put on inside work, such as graining and varnishing, and is in general allowed to do such work as he is able to do. During his fourth year he is given such work as he has not already done, and by constant practice becomes more proficient in all lines of work. This apprenticeship gives the boy a small amount of trade knowledge and enables him to acquire a fair degree of manipulative skill.

No provision is made in the shops for systematic instruction either of apprentices or of journeymen. The line of promotion is from apprentice to journeymen, and from journeymen to foremen. The skilled painter may go into business on his own account.

Deficiencies of workman.—The deficiency most commonly acknowledged by the painters is deficiency in the general education which they believe to be a condition of advancement in their trade. Nearly all painters have a very inadequate knowledge of the hygiene of their occupation. Few possess the trade knowledge necessary for estimating costs and qualities of material, and few possess an adequate knowledge of the principles of color mixing, color harmony, or design.

What the school ought to give.—Before entering the shop the painter should have received in the public school a complete elementary general education and prevocational training in drawing, design, and color harmony.

A serious obligation rests upon the school, as regards instruction of apprentices and journeymen in the shops. This obligation arises from the fact that a thorough knowledge of the hygiene of the occupation is absolutely essential as a safeguard against poisoning. Such instruction, it would seem, should take precedence over every other sort of continuation work. Assuming, however, that this instruction is given, the school may properly undertake to give instruction organized with reference to the technical requirements of the painter by offering courses covering freehand drawing, lettering, design, color harmony, composition of paints, varnishes and other materials, and modern practice in special lines of work.

These courses may be grouped under the following heads (see also outline of course for painters):

1. Trade hygiene: Diseases and dangers of the trade.
2. Art: Color harmony, freehand drawing, and design.
3. Chemistry: Chemistry of color pigments.
4. Mathematics: Estimating.
5. Business practice: Methods of doing business; bookkeeping.

Chapter VII.

RELATION BETWEEN VOCATIONAL EDUCATION AND VOCATIONAL GUIDANCE.

The most fruitful field of vocational guidance, like that of vocational education, is the public school. Vocational help will always be needed for young people outside of the schools, and for older persons who have not found themselves in life work; yet the best service can be rendered in the plastic years of school life, when courses of study and school influences may be made to contribute to the real preparation of the young person for a vocation.

Before discussing at length the place of guidance and its relation to vocational training, we may speak of the needs and conditions which have within half a decade produced the vocational guidance movement.

The age which has made a watchword of the term "efficiency" is peculiarly sensitive to all forms of waste. It calls for such training as shall eliminate waste. The conservation of our natural resources is simply another phase of the antiwaste, or efficiency movement. There is, likewise, a movement spreading through the country which looks more closely to the conservation of our human resources. This movement finds its expression in vocational guidance and vocational education, which are, in a large sense, inseparable.

While the movement for vocational education has been conspicuously advocated from the side of industry, the vocational guidance movement has been distinctively the product of present-day social service. Both movements in their present developments and in their future activities belong to the socially minded educator, philanthropic worker, and employer.

Drifting from school to work, and from job to job, is now clearly regarded as a very costly kind of human waste. Working in undeveloping employments means a waste of time and energy to the worker and a loss to society. To stop this waste and to encourage each boy and girl to plan and make the most of life are the chief aims of the vocational movement.

There is a human waste due not only to poverty, ignorance, and lack of opportunity, but due also to misdirection of effort. Let us consider for a moment the relation of our topic to the urgent matter of unemployment.

The causes of unemployment are divisible into two general classes, impersonal or economic, and personal. Although the latter group of causes is doubtless the less important, there seems to be quite often a commingling of both the personal and the impersonal causes; and in the judgments of the individuals affected, both the employer and the employee, the personal elements loom large. It is with these personal causes that the remedial agencies deal, and it is to these personal causes that the vocational movements are, for the present at least, largely directed.

Excluding abnormal conditions of industry, the selective influence of personal qualifications operates continuously. These personal elements under modern conditions are not only the conventional industrial virtues, like steadiness, temperance, and application, but the subtler, yet equally potent, factors, such as intrinsic fitness, a life-career motive, and a life-career plan. To the student of vocational guidance these last are highly important elements not only as bearing on the incidence of unemployment, but also as affecting the economic career as a whole.

The overcrowding of the traditional occupations, such as law, medicine, and the clerical pursuits, shows what little effort society makes to direct talent into its possibly most appropriate opportunities. Communities obviously should organize such incentives and guidance as will awaken interest in other occupations just as commendable and perhaps more promising than those into which the majority of our young people drift.

Through extension of vocational training opportunities, then, and especially through the provision for prevocational schools, which, when their purposes are better understood, will become self-discovery schools, and as such afford young people and their teachers a most important basis for vocational guidance, the schools are beginning to deal with the task suggested.

Vocational service endeavors to help pupils to self-knowledge, and to reconstruct school programs in order that they may more sensitively minister to the self-discovery and economic needs of different pupils. Vocational service is an instrument for talent saving. In its larger relationships, however, vocational service is only one phase of the social organization of school and vocation. It introduces into education the idea of fitness of the individual, apart from class or group; it introduces into employment the idea of fitness of the task, and appraises the occupations in terms of career values as well as social worth.

There are three directions in which vocational guidance and training provision for the young person already at work must be made: First, to enable the boy and girl to advance in their present employment; second, to prepare them for a change to something more desirable, whether related to the present employment or not; and, third, to stimulate their general development as citizens, homemakers, and social beings.

There will be in the coming years a large increase not only of vocational schools, as such, for the homemaking, professional, agricultural, and commercial employments, but also a large variety of experiments in trade instruction of boys and girls and special groups of young people, some of whom can afford only a limited time.

Comprehensive vocational assistance, through specially trained teachers and others, is now recognized as a proper part of the new machinery of service, service which should begin in the elementary grades and continue, at least, to the period of young manhood and womanhood. This seems to be the conviction of thoughtful educators everywhere.

The old vocational influences have disappeared. Ages less sensitive to childhood's rights than ours, the Middle Ages at all events, saw that the prosperity of the craft as well as of the craftsman depended on rigorous direction and training during the plastic years, and an apprenticeship system resulted which the world will probably not see again. The employer was the teacher, the shop the trade school, and a legal responsibility rested on the employer for the right upbringing and the health and eventual efficiency of the apprentice. Not only was industry, so far as it was organized and monopolized by the craft guilds, thoroughly educative, but the home with its household manufactures, the father's shop, the mother's kitchen, and the simple economic environment, all tended to serve as potent directive and vocationally educative influence.

This condition is gone forever. Much of our schooling at best is devoted to abstract preparation for life, instead of treating the child as if living and now in life. Social control and democratic education are the forces which now must do the work of those vanished vocational forces as yet unreplaced in the preparation of youth for life.

Out of such needs in the fields of education and employment the Vocation Bureau of Boston, as an illustration, has developed the following general aims:

1. To study the causes of the waste which attends the passing of unguided and untrained young people from school to work and to assist in experiments to prevent this waste.

2. To help parents, teachers, children, and others in the problems of thoughtful choosing, preparing for and advancing in a chosen life work.

3. To work out programs of cooperation between the schools and the occupations for the purpose of enabling both to make a more socially profitable use of human capacities and opportunities.

4. To publish vocational studies from the viewpoint of their educational and other efficiency requirements, and of their career-building possibilities.

5. To conduct a training course for qualified men and women who desire to prepare themselves for vocational-guidance service in the public-school system, philanthropic institutions, and in business establishments.

6. To maintain a clearing house of information and investigation dealing with life-career problems.

The public school, as already suggested, is the logical starting point for the work of vocational guidance. Here the child is under daily observation, and the problems of the family make themselves known in countless ways. Just as we have added to the school service the nurse, the physician, the play supervisor, and other agencies of enlightened modern demand, we need to supplement the teacher's insight into the character and attainments of the pupil by the practical cooperation of a vocational counselor in touch with the demands, the conditions, and the opportunities of the world of work, in touch with the intimate details of the families in a particular school neighborhood, and working hand in hand with the teacher, the parent, and later with the employer in making the best investment of the boy's training and possibilities.

Vocational guidance must cooperate with vocational education through the natural channels of approach. These are: The school authorities, the teachers, the parents and advisers of youth, the employers of labor, and public opinion.

Through school authorities.—As a beginning there may be need of a privately supported vocational-guidance bureau to work with the school boards and school officers of a town or city, as the Vocation Bureau of Boston has cooperated for five years with the Boston school authorities.

The vocation bureau entered into a definite agreement with the Boston school committee to establish vocational guidance in the schools of the city. A committee of six masters was appointed to promote cooperation. A system of vocational-record cards was established for elementary and high schools. This system showed the parents' plan for the pupil, the especial ability of the pupil in some line, his physique, and finally his own plan of life, whether to enter a trade, profession, or business. Teaching thus became more personal, and consequently more helpful from the vocational standpoint to the individual boy or girl.

Along with this card system, meetings of teachers were held for the study of vocational conditions and questions, and addresses were given by people of special fitness before schools and parents' associations.

One of the principal provisions in the arrangements between the school committee and the vocation bureau was for a group of teachers to be known as vocational counselors, to be appointed by their respective principals and to represent every school in Boston. Over 100 teachers were so appointed, and they have been meeting throughout each school year to consider the educational opportunities of the city, the vocational problems of the children, and to confer with employers and others who have been invited to the sessions. The number is now over 200.

The work of the vocational counselors has been a labor of love. Nobody has expected that attending occupational talks would alone equip for effective vocational guidance. Highly important results, however, have come out of these meetings.

In the first place, every school in the city has had one teacher—indeed, in some schools committees of teachers have formed voluntarily—to give time and thought to the dropping out from the grades of many boys and girls. These teachers are personally studying the home, street, and other influences which steady or unsettle the children when the compulsory education laws no longer restrain; they are trying to discover what assistance a school can give to parent and child perplexed with the problems of a life career.

There is plentiful testimony showing that fathers and mothers now turn to the Boston schools as never before for advice and help concerning their children's future. Questions as to what high schools or vocational schools and what courses to choose are continually coming before the counselors. The abilities, the interests, faults, and promising tendencies in the children are topics of grave discussion between parent and teacher or principal, the viewpoint being not only that of present school requirements, but also that of the probable careers of the children. In the classrooms the occupational talks have been repeated in order to make clear the efficiency requirements of the practical world outside. School programs, and even commencement-day programs, have begun to show how schools are facing the challenging world which is soon to claim the productive years of these children.

This awakened practical interest of the schools in the life work of the children can not stop short of comprehensive supervision and protection of the after-school careers of boys and girls. Already teachers, on their own initiative and with an expenditure of much time and energy, have gone into the homes of their pupils, and have sought to get first-hand knowledge of the industrial environments. If our schools are to have any guiding relation to life, and all educational reform clamors for this relation, teachers must be given every incentive to touch in such personal ways the realities of the life which their pupils will live.

It should be pointed out here that the creation of this large body of vocational counselors was intended to afford a foundation for the more specialized and technical requirements of genuine vocational guidance. In 1912 the school board detached, at the suggestion of the vocation bureau, three capable counselors to make investigations which should prepare the way for more effective vocational guidance work in the Boston schools.

After the vocation bureau had conducted this work for two and one-half years, the school board early in 1913 voted to establish a vocational guidance department. The number of school vocational counselors was increased to over 200. The plans formulated and carried on under the personal direction of an assistant superintendent are in some of their interesting details as follows:

SUPERINTENDENT'S CIRCULAR NO. 10, 1913.

To the Principals of Schools and Districts:

In order to make the work in vocational counseling uniform, it seems desirable to have the counselors all over the city chosen as follows:

Two from each elementary school building containing a graduating class;
One from each building containing grades above the fourth but below the eighth;
Two from each high school.

The plan which will be outlined later will consist of (1) work with the graduates and (2) with those who drop out before the graduation; hence it will be wise to have the counselor who is to deal with the graduates an eighth-grade teacher, while the other counselors may be teachers of lower grades.

Realizing the high character of service which has been given by the present group of vocational counselors, it is hoped that so far as possible they may be retained, and that in choosing additional counselors the principals will bear in mind the fact that it is essential to the success of our undertaking to have only those who are keenly interested and willing to give of their time and strength. Aside from the counselors, all principals are urged to attend the meetings whenever possible and to cooperate in every way possible.

Through school teachers.—Vocational guidance has its greatest opportunity to serve vocational education through the proper training and equipment of teachers and school vocational counselors. The course given by the vocation bureau to the Boston teacher counselors has been developed through these several years into a university course on vocational guidance. It was given in the Harvard University summer school in 1911, 1912, and 1913; in the University of California and the State Teachers' College, at Greeley, Colo., in 1914 and 1915; and now in Boston University and Teachers' College, Columbia University. Some of the time a class has been conducted in the offices of the bureau.

In these courses many teachers, vocational counselors, and civic and social workers have received suggestions intended to help them advise youth. Gradually the vocational counselor will have less teaching and more professional counseling to do.

OUTLINE OF COURSE ON VOCATIONAL GUIDANCE AT BOSTON UNIVERSITY.

1. The Need of Vocational Guidance.
   - Discussion of investigations of the problem.
   - Local experiences.
   - Federal report.
   - The dropping out from school.
   - Problems and discussion.
   - English reports.
2. Methods of Investigation.
   - Needs.
   - Details of a typical study.
   - Analysis of "necessity" as a cause for leaving school.
   - Standard authorities.
   - Problem of school and college education.
   - Problems and discussion.
3. The Scope of Vocational Guidance.
   - Tentative definition.
   - Description of main issues.
   - Analysis of terms.
   - Discussion of various definitions.
   - Beginnings in vocational guidance.
   - Problems and discussion.
   - Reading of class papers.
4. The Start in Life.
   - Entrance into a trade.
   - English apprenticeship, etc.
   - Present-day industry.
   - Material for vocational guidance.
   - Problems and discussion.
5. Occupational Study.
   - Outline of method.
   - Addresses by employers, etc.
6. Classification of occupations.
   - Analysis of demands and qualifications.
   - Addresses by employer, etc.
7. Material for Vocational Investigation.
   - Conference with experts.
   - Discussion of reports.
8. Social Legislation and Vocational Guidance.
   - Lecture and symposium by specialists.
9. Educational Survey and Guidance.
   - Methods of educational guidance in schools.
   - Symposium.
   - Review of material.
10. Factors in Vocational Choice.
    - Personal, educational, social, and economic analysis.
11. Factors in Vocational Choice (continued).

12. Vocational Guidance Technique.
    Analysis of individual cases.
    Typical sessions of counselors.
    Methods of recording data.
13. Phases of the Vocational Guidance Movement.
    Review of experiences.
    The work of a vocational bureau.
14. Vocational Guidance Abroad.
    England.
    Scotland.
15. Germany.
16. Methods of Follow-up and After-care.
    Discussion of programs.
    Medical inspection at the start in life.
17. Relation to Employers.
    Hiring, promotion, discharge.
    Symposium.
18. Relation to Employers (continued).
19. Relation to Vocational Education and Other Movements.
    Prevocational, etc., types of schools.
    Educational readjustment.
20. Review of Investigations by Members of the Class.
    Social gains.
    Organizing vocational guidance.
    Final definition and terminology.

This course of study aims to provide teachers with the theory and technique of vocational counseling. Following is a list of some of the topics treated by experts at the Boston counselors' meetings:

TOPICS TREATED AT BOSTON COUNSELORS' MEETINGS.

The shoe industry.
The boy and girl in the department store.
The machine industry.
A group of trades for boys.
The telephone industry for girls.
Stenography and typewriting for girls.
Bookbinding for girls.
Architecture.
The use of statistics.
Mechanical and civil engineering.
Electrical engineering.
The machine trades.
Agriculture.
Textile-mill working.
The building trades.
The selling clerk.
The needle trades.
Opportunities in the department store.
A social suggestion on boys and girls as wage earners.
Trained nursing.
Condition in industry for the young girl wage earner.
Vocational opportunities for the girl who completes the high school.
The shoe and leather industry.
Lunch-room and restaurant work for young women.
The department store.
Education for store employment.
The metal trades.
The profession of business.
Girls in the candy factory.
Printing.
The new child-labor law.

Through parents.—Vocational guidance has a great opportunity and responsibility in its cooperation with parents and parents' organizations.

The Boston Home and School Association, for example, is founded on the basic principle of the proper home training of children. To the clear conceptions of the value of fostering cooperation between the home and the school, of the importance of studying methods of child training, and of the relation of civic improvement to child welfare is to be attributed the notable growth of the association.

Through this organization parent and teacher unite in working for the child. Such understanding and cooperation meet a great need in the public-school system.

The meetings of parents' associations furnish a rare opportunity for parents and teachers to become acquainted. The parent may tell the teacher his ambitions for the child and explain peculiarities which might otherwise puzzle the teacher; the teacher, on the other hand, has an opportunity to explain motive and method in school work and to act as a friendly adviser. In vocational guidance this work is of supreme importance, dealing with the home side of guidance, and may be briefly summed up by a quotation from an annual report of the association:

> In no place is this mutual assistance more necessary than in choosing a vocation. Neither the parent nor the teather can decide, to the pupil's best advantage, as to what occupation he should go into until his intellectual propensities, as shown by his school work, are measured with his general aptitudes as illustrated in his home life. Consultations of parents and teachers have proved most effective in gaining a true estimate of the pupil's fitness. That the parents appreciate the value of such cooperation is shown by the large attendance at the meetings where the subject of vocational opportunities and preparation for a vocation is discussed. The opportunity to meet personally a vocational adviser has been gladly seized by the parents. In order to obtain data which will give the teachers enlightenment with regard to every child, the Home and School Association proposes to send out to parents a questionnaire which will elicit the following information: 1. The educational ambitions of parents for their children. 2. How much parents know of educational opportunities. 3. The vocational ambitions of parents for their children. 4. Limitations of parents to carry out their desires. 5. How much parents know of vocational opportunities, and how much serious thought they have given to the vocational needs of their children.

The vocation bureau has counseled with parents and advisers of youth from its beginning. It has cooperated with the Boston Home and School Association steadily, and the two organizations have published jointly *The Boston Home and School News-Letter*, which has been of value to the fathers and mothers of thousands of school children.

Through employers.—The vocation bureau has constantly borne in mind the proposition that a sound development of its work depends not only on close contact with schools, neighborhoods, teachers, parents, and children, but also with employers, business bodies, industrial experts, and the occupations themselves in all their breadth,

variety, and changes. Occupational investigation, fundamental though it be, is not vocational guidance. The investigation determines, to be sure, what kind of cooperation is possible or desirable, and on what terms; it is the basis of vocational information, of plan making for special training courses in schools, and of social and legislative action; but the vocational guidance idea requires that contact with the employments be something more than overlooking. Moreover, there are splendid agencies for specialized research, such as the Sage Foundation, with its thoroughgoing studies of industry. A vocation bureau must be, among other things, a research body; nevertheless, it must depend for some of its most valuable material on important research agencies. Moreover, its work must not duplicate the work of the child-welfare agencies, nor solely promote vocational education. The National Society for the Promotion of Industrial Education and the commissions at work in various cities and States are better equipped for this work. It is the special business of a vocation bureau to organize the prolonged service which takes hold of the child when the life career motive is awakened, to help guide, train, and tide over that child during the difficult transition period into the occupations; direct the child, when it is genuinely ready for employment, into the most advantageous openings possible; and stand by the young workers, so far as may be, throughout their occupational life.

The employer's interest is absolutely essential to such a plan. To fail to profit by his criticism, by his point of view, by his important cooperative possibilities, is to invite failure. The bureau is in close touch with a large number of industrial, commercial, and professional concerns in sympathy with its purposes. Employers have approved its methods and have supported its efforts for more thoroughgoing protection and opportunity for the young worker.

Better to understand the employer's relation to vocational guidance, the bureau organized in 1912 a conference of employment managers. Men representing a score or more of the important manufacturing and business establishments have been meeting regularly in informal conference. In December, 1912, an Employment Managers' Association was formed, whose objects are defined in its constitution as follows:

ARTICLE I.

NAME AND OBJECT.

SECTION 1. The name of this organization shall be the Employment Managers' Association.

SEC. 2. The objects and purposes of the organization shall be:

1. To discuss problems of employees; their training and their efficiency.

2. To compare experiences which shall throw light on failures and successes in conducting the employment department.

3. To invite experts or other persons who have knowledge of the best methods or experiments for ascertaining the qualifications of employees, and providing for their advancement; and more particularly to study the questions connected with the most effective employment of young people.

Through research and publications.—Vocational guidance, like vocational education, must base its work not only upon a study of the youth and his environment, but upon accurate knowledge of the occupations open to young people. Such knowledge, wherever possible, should be gained by first-hand investigation of shops and factories and business offices in every community.

The objects to be sought for in such studies are:

1. To present vocational facts simply and accurately.

2. To make accessible a knowledge of all the employments—the professions as well as the trades, skilled, semiskilled, and unskilled; the business, the homemaking, and governmental callings; and also any new and significant vocational activities of men and women.

3. So far as possible to supply parents, teachers, and others interested with the material necessary for an intelligent consideration of the occupations, their needs, demands, opportunities, relative desirability, training requirements, and the possibilities they offer for careers.

4. To analyze the relation of vocational aptitudes, interests, and habits to modern industrial demands, and thus lay an adequate foundation for a system of training regardful of social as well as economic needs.

The proper utilization of such material should make for a heightened interest in the community's training opportunities, and should make the fact increasingly clear that society will gain immensely by devoting the adolescent period in whole or in part to preparing for the start in life. Above all, the studies should help toward a clearer understanding of what working life ought to develop in social as well as in wage-earning efficiency.

They should show also clearly and emphatically what the world of employment expects and demands of the vocational school.

The movements for vocational guidance and vocational education have done nothing better than in making clear the social wastefulness of employing children from 14 to 16 years of age without a compensating program of training. These are the foundation years of vocational efficiency. Skilled mechanics know this, and they safeguard these years for their children by careful search of available apprenticeship opportunities.

The laws in several States stipulate that children from 14 to 16 years of age must be at work or at school. These provisions mean

little unless they carry a supervised program which looks to definite training for advancement in a selected occupation.

This at bottom is the social viewpoint. Efficiency in living life as a whole, as well as efficiency at work, is the goal of the vocational movement in education. Vocational guidance aims to lay down the specifications for a life career, vocational education to supply the best methods for working them out; and if the message of these enterprises is heeded in the occupations, we may expect employment to be a period for consummating the labors of the school.

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Chapter VIII.

PROPER METHODS OF FINANCING.

PRELIMINARY.

The chief source of material used in the preparation of this chapter is the Report of the United States Commission on National Aid to Vocational Education. Credit should therefore be given to the members of this commission for the fundamental ideas which underlie the main features of the following suggestions. The terms used in describing the various types of education are the same as those used in the chapter upon terminology, to which the reader is referred for specific definitions and illustrations whenever words used are not clear. Appreciation should also be expressed to the National Society for the Promotion of Industrial Education for use of its reports, to the Massachusetts State Board of Education for its report of 1913–14, and to such other persons or bodies as have contributed in any way to the literature which has helped in the final presentation of this important topic.

It was thought that the method of consultation and conference in arranging this material would give a result which would be of much more value than would be the opinion of any single individual. This chapter should therefore be regarded as a composite statement of the most suggestive ways of financing this method of education which have yet presented themselves.

Cost is the heart of the business system. The business man or corporation counts and provides for cost before any undertaking is entered into, and at every step of its later development. Sound finance lies at the basis of every successful enterprise in the business and industrial world, and it is certainly of the highest consideration in the great fields of education, both general and special.

The established forms of education in the so-called cultural and liberal branches have long been maintained at public expense. As it is so largely a question of State-wide welfare, the State is recognized as the large unit, supervising, cooperating with, and aiding the work of the local unit of town or city.

Along with general studies, training for business and the professions has had a measure of provision; but vocational education in its broader sense has only lately come to receive even a part of the attention it rightly deserves.

In early times the responsibility of training for an industry rested upon the family. Then the son followed the trade of his father.

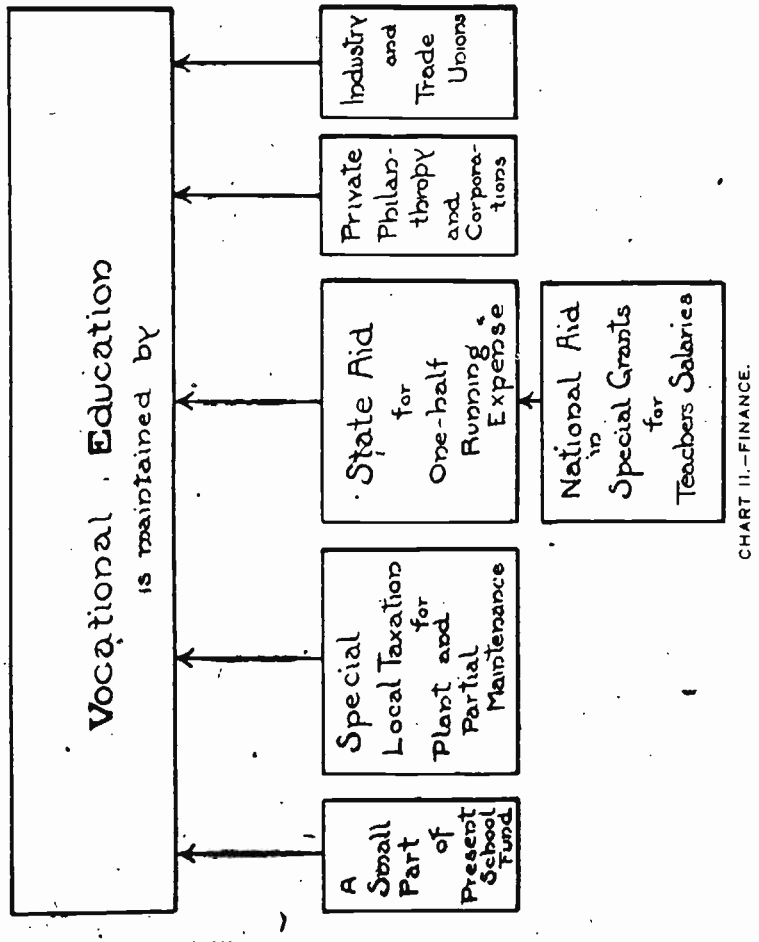

CHART II.—FINANCE.

Later this responsibility was transferred, in a measure, to industry; and the apprenticeship system resulted. Now has come the movement to transfer the responsibility still again and place it upon the State through the establishment of schools. And thus the schools are in turn asking industry to help bear the burden, to the extent of providing apprenticeship opportunity and counsel to supplement the best that the schools can do.

Before discussing methods in financing vocational education, let us clearly understand just what it is that calls for support. From every point of view the establishment of a system of vocational schools should be clearly defined in its financial aspects. Its purposes and provisions must not be confused with those of other kinds of education, however worthy these may be in themselves.

The idea is spreading rapidly among the States that State support should be given for education carried on by local communities. The general tendency seems to be for the State to give money to encourage new kinds of education. Local communities are still left to pay largely for the support of the liberal and cultural education which the schools have long given.

Vocational education, then, is the later form that calls for additional support. Briefly stated, there are six kinds of vocational education, as follows: Professional, commercial, agricultural, industrial, home making,[1] nautical.

Professional education is provided for by public and private schools and institutions, for pay, in the East; and by all grades of educational institutions, particularly State universities under certain conditions without cost to the student, in the West. It is usually for persons who have completed their secondary education, however.

Commercial education is also provided for, in some measure, by public commercial schools and courses, by private business schools, and by college and university departments of business administration and finance.

Nautical education, the least of all in numbers affected, is provided for by the Massachusetts Nautical School and by private and professional schools.

We have left, then, three kinds of vocational education—agricultural, industrial, and household arts—calling for public and private support, in addition to the great sums of money already devoted to the cause of education.

The problem of support for these three forms of vocational education has also three natural and clearly defined aspects:

I. Vocational education supported by the public.
II. Vocational education supported by private philanthropy and by corporations.
III. Vocational education supported by joint agreement between employers' associations and labor unions.

I. VOCATIONAL EDUCATION SUPPORTED BY THE PUBLIC.

This is much the largest division of the problem and the one awakening the greatest interest the country over, even though but few of the States have as yet passed State-wide laws establishing systems

[1] Used at present as a more comprehensive term than "household arts."

of vocational education. This division is in so great a degree a question of industrial education that the principles and methods worked out by the National Society for the Promotion of Industrial Education may be regarded as fundamental in its treatment. Substantially the following principles have been evolved by the national society and by State and local boards and agencies. An effective program of vocational education will cause an increase in the expenditure of public moneys for school purposes, for the following reasons:

1. More money will be needed to pay teachers, because those equipped with the desirable qualities and trade experience are now receiving in the trade a higher salary than has formerly been paid to teachers of such work.

2. This work demands selected teachers of experience and preparation in the trades.

3. Shops when operated in connection with the schools cause additional cost in equipment and maintenance. In some cases this may be partly offset by the production of articles in the shop.

4. Opening up new types of service to a group for whom as yet little or no provision has been made.

It may here be noted that the cost per pupil for training in the vocational schools is now somewhat higher than for training in the ordinary schools because of the added cost in teaching and equipment, as above stated. While it is yet too early to give accurate statistics, the fact remains and makes the need of added revenue more emphatic.

Many local communities are already burdened by the attempt to meet the demands which the present time is crowding upon the regular schools. In some towns and cities the added taxation can be undertaken only with great difficulty, if at all. Local communities are not willing, without State aid, to tax themselves for the purpose of training workmen who are extremely likely to drift off into other communities to raise the standard of citizenship and workmanship elsewhere.[1]

As far as the community is concerned, the necessary revenue to provide for vocational education may be provided for in two ways: First, by a redivision of the revenues of the community so as to give a larger proportion to vocational education. This method would, of course, diminish the portion devoted to cultural education. Second, the needed revenue may be secured by a special appropriation for vocational education in addition to the amount given for general education. This method, as has been said above, gives a greater burden than some communities with low value and taxable property and yet having considerable population can well bear. All authorities agree

[1] Cf. Rept. of U. S. Com. on Nat. Aid to Voc. Educ., pp. 32–33.

in the wisdom and desirability of the plan generally followed in this country of a special levy for public-school purposes in the annual tax budget, the resulting revenue to be expended by the local school board for such kinds of education as the community demands.

Local resources are, therefore, upon the whole, insufficient for the desired expansion of vocational secondary education in the vocational lines that will provide training for thousands of young people in every State. For this reason the larger community, the State itself, must contribute to the expenditure. While this entering into partnership by the State is primarily to give financial aid and encouragement, it brings other advantages which are concerned with the general welfare of the State and individual in almost the same proportion as they are concerned with vocational education. It may well be borne in mind, however, that most effective results can be produced only when there is complete cooperation between the local community and the State, with the local community exercising its own initiative so far as may be possible. The following are the generally accepted reasons for aid by the State in establishing vocational education:

1. To encourage local communities to give specific vocational education as a new and needed kind of training, beneficial and desirable in the interest of the State as a whole.

2. To aid communities with their varying resources to provide effective vocational training.

3. To secure for the State the right to a reasonable participation or voice in the development of vocational education in the State.

4. To make it possible to secure a "State minimum of efficiency" in the conduct of vocational education.

5. To pay the just share of the State in a kind of education which, comparatively speaking, must be expensive, but which is of State-wide benefit.

6. To place upon the State a part of the cost of training "mobile labor."

The welfare of the community means the welfare of the State, and the need and value of cooperation in the widest possible extension of the new education are self-evident.

The amount of aid to be given by the State is, of course, the all-important consideration. It should be sufficient to induce local communities to get the work started and to justify reasonable voice by the State as the nonresident partner in the control and administration; but State aid should not be so much as to sacrifice local initiative and support, or that pride and interest which is characteristic of all people in the institutions that have grown out of their own planning and their own sacrifice. Up to this time the general method has been to let the local community furnish the plant and

equipment and pay approximately one-half of the operating expenses. The town or city should be required to show a need for the school and its interest in it by building and equipping the plant and paying half of the operating expenses, the State paying the other half. Another way is for the State to pay two-thirds of the salaries of all the teachers employed in the work, whether in trade subjects, or technical subjects, or such academic subjects as may be needed to complete well-rounded courses. Two-thirds of the salaries of the teachers is assumed to amount to practically one-half of the operating expenses. Under this plan of payment the State board of control is relieved of the difficulty of auditing the complicated accounts of the local communities. About all that is necessary under this plan is for the local authorities to make affidavit at the end of the year that they have spent so much money for instruction, or for teachers' salaries. On recommendation of the State board, after the work of the school has been approved, the aid should follow.

Payments to local communities should not be made automatically, but only with the approval and recommendation of the proper State board of control for work actually accomplished. The State is a different entity from any or all of the communities within it. The money in its treasury does not belong to the cities and towns, but to the citizenship of the State as a whole, entirely irrespective of the local boundaries. It should be spent by the State, not for the benefit of the local community, but for the best interests of the whole Commonwealth. The State should give money to the town or city in payment for a definite service—that of providing a good school giving a good training for good citizenship and good workmanship. Any locality should be entitled to its share of this money, not automatically as a right, but only when it has rendered the service for which the State has, through its law, agreed to pay. The State board of control should not only be charged with the duty and responsibility of finding out for the State whether or not any school is meeting reasonable standards of efficiency, but it should also be authorized to distribute money to the local community only after and not before the work has been accomplished.

The better plans seems to be to approve the school program in advance. For example, a full program for the work of a school is drawn up by a local board, in consultation with the State board, and is approved by the State board before being put into effect. This enables the State more easily to set a standard and to follow it up in the actual conduct of the school. It strengthens the bond of cooperation and interdependence between the State and the community. Financial aid is not given, however, until the work has been done.

In passing upon a school, a State board should have the power to go over every feature of its work, including all such items as location, equipment, courses of study, method of instruction, qualifications of teachers, and expenditure of money. In many of the States this is secured by a provision in the law giving the State power to approve the school, but leaving the latter free to operate according to its own discretion.

State-aided vocational schools should be free to all the people of the State. If State funds are to be used for their support, these institutions should be open to every child in every part of the Commonwealth. Each school must, of course, adapt itself to local needs and conditions. There might be a school at one point for one industry and other schools at other places for various different industries. In order that every one in the State may have a chance to prepare for the wage-earning occupation which he wishes to follow, a system of exchange of pupils should be put into effect in order to meet the case of pupils nonresident in a given community. Provision should be made by a contribution from the community in which he attends school, amounting, of course, to one-half the real cost of training. This can be accomplished in two ways: First, the community in which the pupil resides may pay the community in which the pupil attends school the full cost for tuition of the pupil and later receive reimbursement from the State to the amount of one-half the expenditure; second, the community in which the pupil resides may pay the community in which the pupil attends school one-half the cost of such attendance. It would appear that from the standpoint of vocational education the first plan is preferable, inasmuch as all financial dealings would be carried on between the State and the individual community rather than between different communities, and further, that partnership of the State in vocational education would be continued.

Such method of interchange of pupils between communities would limit or reduce the number of vocational schools in a State, and would tend to lessen the per capita cost of training pupils. The total cost in plant and equipment, and the running costs, to be divided between the communities and the State, would be reduced. Cooperation, supervision, and the maintenance of a desired standard would be more fully assured.

State aid for vocational education in towns and cities has a foundation in theory and practice. Industrial welfare demands it, and the results already worked out give promise of better things to come.

A matter of considerable interest to this new movement in education, and a possible item of cost to the public, is the training of teachers for the vocational schools. Persons drawn from the trades and having trade experience only must be given further training

in related subjects and in the principles of teaching. They will be slow to do this at their own expense and loss of time. Such special preparation must largely devolve upon normal schools and upon towns and cities and States in the conduct of particular groups or classes of these new recruits to the teaching force. Pay must be made attractive and the means of entering inexpensive. Fortunately it may be said that several States are already taking progressive steps in the training of such teachers.[1] One of the most recent experiments along this line has been the attempt in Massachusetts to train teachers through evening instruction work to become instructors in the vocational schools of the State. Several classes of this kind were carried on in various centers of the State during the fall and winter of 1914–15. The results of this training will be seen in the work of the vocational schools in Massachusetts during the present and succeeding years. Hence, this may serve as a basis for future action in the training of teachers.

FEDERAL AID FOR THE STATES.

Federal aid is needed to provide the same stimulus to the States which the communities receive by State aid. The States are in a sense are industrial and commercial unions competing in a friendly way with one another. The large argument in favor of national grants for practical education in the communities is that this Nation is an economic union. The markets of the world are open to the products of our industries, and therefore the National Government is interested in the industrial efficiency of every section of the country. If the Nation is to profit as a whole, then the Nation should provide the stimulus and support which would encourage the States to provide vocational education to increase the wealth.

The States are already burdened to their limit, in many cases, for general education.[1] There are also great differences among the States in taxing ability. New York, for example, has eighteen times the per capita wealth of Nevada. The burden of establishing industrial schools will fall very heavily on two types of communities or States—the rural community with scattered population, and the industrial center whose population increases rapidly and whose taxes increase in greater proportion than does the amount of taxable property. The Southern States, as a rule, are poor and will have a hard problem.

The problem transcends State boundaries, and is distinctly a national one. "A man may be born in Indiana, trained as a worker in Massachusetts, and later spend his days as a machinist in Cali-

[1] The fundamental ideals involved in the training of teachers for vocational education were taken from the report of the commission previously referred to. Cf. pp. 75–76.

fornia."[1] Twenty different States furnish the men for one construction concern in New York. This concern, again, does business in 12 different States. It is estimated that about 75 per cent of the workers in many cities were born and trained in other places than those in which they are working.[2]

The magnitude and importance of the subject as a national question is indicated by the fact that members of the Cabinet have interested themselves even to the extent of appearing before the commission on Federal aid favoring plans for national support. Hon. William C. Redfield, Secretary of the Department of Commerce, made an extended statement to the commission on May 8, 1914, in which he stated that he regarded the question of vocational education as being "the single most serious subject affecting American life" which is under consideration to-day. He further stated that he believed that the problem is so large and covers so much ground that it should be dealt with by the greatest power in America. A statement was also made by Franklin B. Dyer, of Boston, April 30, 1914, to the effect that the stimulus which would come from Federal aid is a necessity in order to place squarely before the country at large the importance of vocational education, and further that there was no doubt that the Government could with propriety designate methods of expenditure of money raised by it.

There is abundant precedent for national aid to the States for vocational education, from the Morrill Act of 1862 to the Smith-Lever Bill of 1913.

One hundred and thirty million acres of lands, all told, have been granted to the States for common-school development. The income from these grants has exceeded $600,000,000. This amount has been used largely for teachers' salaries. These grants have been largest in the West, because of the setting aside of land by the Government for school purposes in each new State as it came into the Union from the Northwest Territory.

Under plans proposed by the vocational education commission large sums of money may soon be devoted annually by the Government to industrial schools. These may be allotted for the salaries of teachers in industrial, including agricultural, subjects; in the training of teachers for industrial, agricultural, and household economics subjects.

The device of the national grants to local districts has been in operation in England for nearly a century. From this experience there have been developed certain principles which are of special significance to legislation involving both State and Federal aid in

[1] See Rept. of U. S. Com. on Nat. Aid for Voc. Educ., pp. 32–34.
[2] Rept. of U. S. Com. on Nat. Aid for Voc. Educ., App. I, p. 118, "Mobility of Labor."

this country. English practice teaches us that the purpose of grants must be definite. The need for help in a community should be an actual need, grants should be fairly distributed, the amounts should be based on actual community expense, and they are to be granted only upon the maintenance of fixed standards of school efficiency and cooperation between the State and the school.

Sidney Webb, the best-known English writer on this subject, in his book, "Grants in Aid," tersely states some of the principles developed from English experience in the form of reasons for grants by the English Government to local districts as follows:

> It has accordingly become an axiom of political science that, with our English administrative machinery, grants in aid of local governments are indispensable.
>
> 1. For an equitable mitigation of the inequalities of burden.
>
> 2. To secure effective authority for the necessary supervision and control of the National Government.
>
> 3. To encourage the kind of expenditure most desirable in the interest of the community as a whole.
>
> 4. To make it possible to attain to anything like a universal enforcement of the "National minimum" that Parliament has prescribed.

These reasons the English people have come to accept as the result of nearly a century of experience, and it is by far the best statement of principles and reasons for granting national aid which has come to our attention in the preparation of this report.

II. VOCATIONAL EDUCATION SUPPORTED BY PRIVATE PHILANTHROPY AND CORPORATIONS.

Private philanthropy has its definite place in American life; that place is to do new things which need to be done, to blaze the trail, pioneer the way, and prove the need. The private school can always experiment, but can rarely consummate on a large scale. Schools carried on under public auspices can consummate, but can not generally experiment as satisfactorily. Vocational education, therefore, carried on by private funds should look to turning over to the public school the work and methods which it has proved worth while, and make these benefits available for larger groups. As a general thing, gifts to such work should have regard to the final outcome of their benefaction, which should be that of encouraging and stimulating the public to act on a wider and larger scale with public funds when the worth of that work has been proved. It is against good public principle to appropriate public money to private institutions in the control of which the public has no voice.

This division includes schools conducted by individuals, corporations, and institutions, some of which are of a permanent nature, to do the work which the public schools have failed to do or can not well do, especially in the case of older youth and young men

and women, and in the East much more than in the West. Typical examples are the North Bennet Street Industrial School and the Wentworth Institute, in Boston, and the apprenticeship school carried on by the General Electric Co., at West Lynn. Such schools set standards for the public vocational schools, and in a measure round out the system of industrial education. If they were conducted by the State and free to the people of the State, as in the West, they would reach thousands who can not now afford the expense of attendance.

Nor is there lacking evidence that such schools can be taken over by the municipal authorities and carried on successfully. There are already notable examples where this thing has been done; among others may be mentioned particularly the Boston Trade School, which was formerly carried on under private auspices, as was the Manhattan Trade School in New York, and the Milwaukee Trade School in Milwaukee, Wis.

III. VOCATIONAL EDUCATION SUPPORTED BY JOINT AGREEMENT BETWEEN EMPLOYERS' ASSOCIATIONS AND LABOR UNIONS.

Formerly master and workman felt and discharged a common duty and responsibility for the training of workers, in order that the integrity of the craft might be preserved. Modern industry shows a decided tendency to throw the entire burden of expense and trouble of every kind on the schools. Part of this is, of course, due to the fact that the schools have not yet been able to present to modern industry a program of cooperation in vocational education which promises to be put into widespread use. It is certain that the school men can not solve this problem themselves. They must have the close and intimate help of employers and employees in the trades and other occupations dealing with the question. With the school authorities as a third party, an increasing number of employers and trade-unions will undoubtedly be willing to confer together upon ways and means by which they can aid the schools in the training of workers.

Matters which ultimately and vitally concern both the employer and employee are being dealt with by means of joint agreements, known in some industries as protocols. It has come to be recognized that in many industries, as in the case of the garment trades, the training of the worker should be as much a matter of trade agreement as hours of labor or scales of wages. Under the protocol a growing number of employers' and employees' organizations are finding themselves willing to recognize educational training and to go to the trouble to so organize the work as to offer their young workers time away from their employment for such training. Under such

private arrangements the vocations themselves must bear either all or a part of the cost. Shops must offer the opportunity for the shop training, leaving the schools to give related instruction; or, in many cases, shops and factories and commercial houses must provide facilities for classroom instruction under the roof of the plant. Some great industries, like the garment trade, draw together large numbers of workers in the unions having large resources. Employers and unions should be led wherever possible to undertake, to a large extent at least, the joint burden of responsibility concerning their own workers. The financing of such schemes should be in part by the workers and in part by the employers, and if in cooperation with the public schools, in part by the public, subject, of course, to such control and approval as is consistent with the expenditure of public money for educational purposes.

The population and industrial nature of a community determine the problem of local taxation for the support of industrial education, as has already been indicated; but State aid or National aid should be available to all communities, large and small, alike, upon the basis at present of local expenditure in proportion to the contribution which the community itself makes and the meeting of certain standards and conditions.

To recapitulate certain financial sources briefly, it may be said—

1. That some progress can be made in vocational education by saving effected by reorganization and readjustment in the present plan for education in the community, this to include a segregated budget of school expenditures. The relief afforded by this method will not be sufficient and will not greatly affect the general question. Nevertheless it is one of the methods by which waste may be avoided and the support of the public secured.

2. That in some instances increased taxation of the local community may be resorted to, but that the burdens thus placed upon the various communities will be onerous and unequal.

3. That the problem is State wide and even of national proportions. State aid for communities of varying needs and abilities, and national aid for States of varying economic conditions, are absolutely necessary for any large and lasting solution of the problem. Industrial and educational experience in this country and abroad justifies this point of view. This is the only nation-wide solution.

4. That much may be done by private philanthropy in experimenting, pioneering, and setting of standards.

5. That large communities may settle the question for large industries by educational, industrial, and trade-union cooperation and agreements.

The considerations which have arisen in discussing this problem of finance, as well as the considerations which have arisen in the other

chapters of this book concerning the work of vocational education in general, force upon us the conclusion that vocational education is bound up indissolubly with many other vital problems. Among these may be mentioned those which have to do with the efficiency of the workers on the one hand, and with the state of public opinion and the willingness of the public to sacrifice on the other; with the prosperity of the community and the State, as well as with the taxing resources of the community; with the general allotment of funds not only for general education, but for the other needs of the community; and with the methods of taxation in operation in a given State. These problems are all, to a greater or less extent, further complicated by the question of cooperation between worker and employer, by the traditions and methods in use in the great field of education, and by the general progress of industry.

From the fact that these problems are so intricate and subject to such sudden and unexpected changes, it is almost impracticable to suggest methods and plans for financing vocational education which shall meet all of the varying needs of the widely scattered communities in which it may be desired to introduce types of education to serve specific ends.

Chapter IX.

PROBLEMS OF VOCATIONAL EDUCATION.

Vocational education in schools is of comparatively modern development, especially in other than professional fields. Hence, administrators still encounter a large number of unsolved problems. Furthermore, all education is still in prescientific stages of development; and in proportion as efforts are made to reach scientific stages, new problems are revealed in the fields of liberal or general education, which also affect vocational education. The object of this section is chiefly to attempt to analyze and give definite statement to some of these problems.

It is believed that every attempt looking to clearer analysis and definition of the problems of vocational education will hasten the day of experimental and other systematic attempts at the solution of these problems. This process of analysis and definition should be steadfastly opposed to the thinking in terms of "omnibus" generalizations that is so commonly characteristic of addresses and published articles dealing with the purposes and methods of vocational education. Definition, systematic organization of experience, experiment, measurement of results—these are some of the means by which education may be expected gradually to take its place among the departments of applied science.

I. THE RELATION OF GENERAL, OR LIBERAL, TO VOCATIONAL EDUCATION.

Problem 1. To what extent do studies designed for liberal education "function"[1] as to their content in various fields of vocational training?

For example, do Latin, ancient history, and algebra "function" at all in the training of the physician for his vocation? Do mechanical drawing and science "function" in the making of the bookkeeper? Does the study of music and art make any recognizable contribution toward the efficiency, on the vocational side, of the machinist, the farmer, or the cook?

[1] The word "function" is used here in the sense that means and methods as adopted lead to results as intended. Studies, as well as methods of instruction, are means to ends; they "function" when the ends are realized as intended.

Problem 2. To what extent and in what way do studies in general or liberal education so "function" in mental training as to make important contributions toward vocational efficiency?

For example, does the study of mathematics contribute to the development of the mental powers requisite in the lawyer, the dentist, the music teacher, or the homemaker? Do the interests and types of appreciation develop in the study of literature "function" at all as valuable mental qualities in the training of the engineer, the house carpenter, or the clerk?

Problem 3. To what extent and under what conditions do various special types of vocational education so "function" as to result in the knowledge, appreciation, and ideals that are important in liberal education?

For example, in the case of a student who has studied little or no science, what will the vocational study of agriculture contribute as a by-product to his general insight into the applications of science? In what way will the study of teaching as a profession supplement deficiencies in liberal education? Will an effective program of vocational training for the house painter contribute materially to his general intellectual and esthetic development?

Problem 4. To what extent and under what conditions will systematic vocational education contribute, as regards mental training, to the ends that are valuable in general education?

In what ways, for example, does the close application to practice and theory required in the training of a printer develop such so-called general intellectual powers as attention, concentration, order, or the concentration and close thinking required on the part of a boy studying farming practically and theoretically result in the development of corresponding general mental powers? To what extent do the strong interests frequently evoked by vocational studies call into activity mental powers left inactive in general education?

Problem 5. To what extent is it expedient and desirable that the beginnings of systematic vocational education shall be postponed until after a definite degree of general or liberal education has been attained?

For example, if we assume that pupils are required to attend school until 14 years of age, is it expedient or desirable that from 12 to 14 a program consisting in part of vocational and in part of liberal education shall be made available? Is it practicable or desirable, in the case of youths from 14 to 16 who are to enter industrial callings at 16 years of age, to offer combined programs of liberal and vocational education prior to that age?

Problem 6. In case it seems desirable to divide the pupil's time at any given stage between vocational and liberal education, how shall the division be made?

For example, shall studies be alternated by hours, as in an ordinary commercial high school; that is, one period, perhaps, being given to algebra, another to stenographic practice? Or shall the day be so divided that one-half may be effectively given to concentration on vocational pursuits and the other half to general education? Or is a division on the basis of longer periods desirable; for example, one week being given to liberal education, another to vocational; or six months to liberal and six months to vocational education? Is a third program preferable, whereby the central part of each working day shall be given either to vocational or to liberal education, as the case may be, with the marginal part to the other type? For example, pupils might work from 8 to 3 o'clock on general studies (or vocational studies), and from 3 to 6 on vocational studies (or liberal studies). In practical life, it will be remembered, men usually pursue their vocations during the greater part of each working day, reserving evenings, holidays, etc., for recreational and cultural purposes.

II. PROBLEMS OF SO-CALLED GENERAL VOCATIONAL EDUCATION.

It is contended that certain studies or practices serve as a basis for general vocational education; that is, presumably give fundamental elements needed in many callings.

Problem 1. To what extent are any of the studies usually found in a program of general education (excepting reading and writing) vocationally fundamental to a number of callings?

For example, it was formerly asserted that the study of Latin was vocationally fundamental to the subsequent study, for professional purposes, of law, medicine, theology, education, and botany. It has long been thought that the study of mathematics is vocationally fundamental, not only to the engineering professions, but also to law, medicine, and almost all other advanced pursuits. It is a widespread belief that mechanical drawing is fundamental, in a vocational sense, to industrial, agricultural, and perhaps even commercial pursuits. Again, there survives a belief that a program of vocational education might be devised which would train the so-called handy or all-round practical worker.

Problem 2. Does modern society present a general demand for the person who, while not exceptionally proficient in any calling, is ready and practical in many; for example, the man "handy" with tools, the "all-round" clerk, etc.?

Problem 3. What courses of practical instruction will train the "handy" man, as he is in demand, for example, in farming communities?

III. PROBLEMS OF THE TRANSFER OF RESULTS OF VOCATIONAL EDUCATION.

Problem 1. To what extent and under what conditions do the results in skill, knowledge, appreciation, and ideals (or of practical experience in general) in one occupational field constitute an asset for entrance into another?

Problem 2. To what extent can the results in skill, knowledge, appreciation, and ideals (or of practical experience in general) obtained in one occupational field be utilized as a basis for systematic training toward another occupational field?

The following are examples of these problems: (1) To what extent does expertness in running constitute an asset in learning to swim? (2) To what extent can a thoroughgoing education in the practice of medicine be utilized when the doctor wishes to become a farmer? (3) How far can professional competency as a bookkeeper be regarded as an asset when the bookkeeper wishes to become a machinist? (4) If a man has been well trained as a machinist, to what extent can such training be drawn upon in equipping him to be a house carpenter? (5) A farmer's son "picks up" a great variety of vocational experience; to what extent does this constitute an asset when he wishes to become a physician, a locomotive engineer, a manager of an industrial enterprise?

(*a*) It is obvious that these problems are capable of being scientifically investigated as soon as psychology possesses the necessary tools. There exist now a large variety of popular beliefs or prejudices on the subject. For example: (1) Some vocational-school authorities believe that boys aged 16 or more, who wish to learn a trade, succeed much better if from 14 to 16 they have had a miscellaneous industrial experience as job workers in various unskilled or juvenile occupations. But effect of selection is obvious here, and probably deceptive. Only boys of exceptional character, probably, seek admission to industrial schools after such a period of miscellaneous experience.

(2) There is a widespread belief that the varied and often intensive experience obtained in farm life constitutes a valuable basis for almost any kind of subsequent employment.

(3) It is also believed in some quarters that persons who have for several years habituated themselves to a special line of manufacturing or commercial employment (for example, bookkeeping, shoemaking, draftsmanship, weaving) are permanently disqualified in large measure from taking up employment in other fields.

(*b*) Even superficial analysis will show that these problems must be approached with reference to particular types of qualities involved. For example, few people would assert that skill obtained

in playing baseball can be directly utilized in learning to swim. On the other hand, results of physical development, such as lung power, strength of arm muscles, etc., obtained in baseball may constitute a valuable asset in learning to swim. Again, the life of the farmer's son may give little direct preparation in skill or knowledge for the work of a physician, but, on the other hand, a general attitude toward work, a disposition to finish jobs once undertaken, an appreciation of the value of money or recognition resulting from successful work may in large measure be transferred.

(*c*) Much will depend, naturally, upon the relationship of the various occupations involved, according as these deal with similar working conditions, similar tools, identical materials, etc. One would expect a drill-press operator to bring to the work of the planer a variety of important assets, while one would not expect the bookkeeper to bring to house carpentry at least similar assets.

(*d*) It must be recognized that prolonged practice in any occupation may, in an important degree, disqualify the person for pursuit of another not related to it. The man who has followed farming for several years is in many respects disqualified to become a counter salesman of dry goods; the actor disqualified to become a farmer; the machinist to become a bookkeeper; etc.

(*e*) The question is an important one for several reasons. In the first place, there are many occupations which can not be entered upon in youth—for example, that of locomotive engineer. The locomotive engineer must have served in some other calling for several years, for which, presumably, he could have had systematic training. Will his previous experience as stationary engineer or as fireman constitute, in the long run, a sufficient preparation for his work as locomotive engineer? Again, systematic vocational education in schools for some occupations is easily possible; for others, extremely difficult. If a transfer can be easily effected, then we might train a person to be a house carpenter or a farmer, even though we knew that eventually he would follow the sea as a sailor or later work underground as a coal miner.

IV. THE PROBLEMS OF PROFESSIONAL EDUCATION.

The problems of professional education are in the main remote from the purpose of this paper. But one of general interest is that relating to the extent to which a program of professional training must base the so-called technical studies upon foundations of practical experience.

Problem 1. To what extent does effective vocational education for any profession require that the present order of studies which involves the giving of technical instruction in advance of practical

experience should be modified, or even reversed, to the extent that a certain amount of practical experience shall be taken perhaps at the outset and at intervals in the course of professional training?

For example, in the training of teachers it would be practicable, if desirable, to have a certain amount of practice teaching done at the very start as a basis for the subsequent study of methods, theory, etc. An engineering student might be given practical employment in something of an apprentice capacity along practical lines. A prospective physician might serve as a hospital orderly, nurse, etc., before completing his training.

Problem 2. (Undifferentiated professions.) To what extent shall training for professions which are not as yet clearly differentiated presuppose as a basis a complete professional training along the lines of professional training already established?

In the field of agriculture, for example, professional field of "administration of agricultural plants," "rural engineer," "rural journalist," etc., seem to be in process of differentiating. In medicine there is a demand for specialists in such fields as optometry, school physician, etc. In the commercial occupations, certain fields of expert inquiry, statistical work, and salesmanship seem to be assuming the proportions and standards of professions. In industry we have as yet no systematic training for the positions of foreman, overseer, and the like, except in very few fields.

(*a*) At present it is often assumed that before one may take up professional training in these undifferentiated or "nascent" professions, it is necessary that he should have a complete professional training along the established lines. This process, however, is costly, and it is a question whether the resources of the community or of the individual trained are always equal to it. The question of necessity must also be considered. For example, the school nurse and school physician represent distinct demands to-day in specialized fields for which it is doubtful if the historic training of the nurse and of the physician are at all necessary prerequisites. The professions of rural engineer and rural journalist may, on the other hand, be of such a nature as to require not so much a large amount of technical training in agriculture, as maturity and a wide range of experience, before they are taken up.

(*b*) To some extent the problem involved is one of maturity and experience, rather than the purely technical training of the person embarking in such work. Most directive or managerial positions require maturity and experience. It is quite probable that in some of these professional lines the ultimate solution will be that the person will take a definite amount of practical training for the historic occupation itself, and will then enter upon some field of practice with a view to returning, later, for advanced study toward mana-

gerial or other related work. It has been proposed, for example, that a school for the preparation of superintendents and principals of schools should presuppose perhaps five years of experience as teacher before systematic study for the administrative work is begun.

V. PROBLEMS OF INDUSTRIAL EDUCATION.

Because of the highly differentiated character of the trades and industries, a series of problems arise in industrial education which have not yet appeared in other fields.

Problem 1. To what extent and under what conditions shall training be given for highly specialized occupations in manufacturing and other related callings where so-called "unskilled" or specialized service is in large demand?

For example, in the manufacture of cotton and woolen cloth, the number of specialized occupations is now nearly 100. Some of these require little or no special training, and may be adequately supplied by the labor of children or women. In shoemaking, it is said that the number of specialized operations for each of which individual workers are specialized, reaches several hundred. Similar tendencies toward differentiation and specialization of occupation are found in the food-packing industries, iron and steel working industries, small hardware and jewelry manufacturing, printing and publishing, the building trades, transportation, and even certain phases of agriculture, such as sugar production, wheat-growing, etc. The building up of department stores, large jobbing houses, etc., in commerce increases also in a large degree specialization in salesmanship and clerical service.

(*a*) There is no evidence that the tendency toward extreme differentiation and specialization in occupational fields will be stayed. In proportion as economic units of production and exchange enlarge, supervision becomes more efficient, and mechanical devices are invented and improved, so, it would appear, in almost all occupational fields specialization and the relatively large employment of unskilled service seems to increase. The persistency of this tendency will depend upon the economic advantages resulting from such specialization.

(*b*) On the other hand, from the standpoint of the individual worker, serious questions as yet uninvestigated arise as to the psychological, moral, and physical effects of extremely specialized occupation. A large part of personal growth in character, physical powers, and probably also in mental capacity has always been dependent upon the occupation followed. Early specialization may result in a complete arrest of development in these lines.

It is probable, however, that specialization of occupation for one whose physical growth has been completed is much less dangerous

than for one still plastic. Hence, while extreme specialization for a worker at 15 years of age may give bad results, the same may not at all be true if the occupation is entered upon at the age of 22 or 23. This represents a promising field for further inquiry and investigation.

(*c*) In the meantime there are good grounds for urging that all persons be given an opportunity for systematic vocational education, either in some trade requiring various operations, or over a series of the special operations found in a highly specialized manufacturing or other economic process.

Problem 2. To what extent and under what conditions can training for foremanship be organized and conducted?

In almost all fields of organized industry the post of foreman, overseer, or other special director of groups of workers is clearly recognized. Such posts commonly require (1) the degree of expert knowledge of the occupation which a skilled worker is supposed to possess; and also (2) qualities not easily described, but related to leadership, capacity to direct workers, knowledge of human nature, organizing ability, etc.

(*a*) Foremen must combine, of necessity, native ability with a high degree of training; hence almost invariably these must be selected men who have had considerable experience.

(*b*) Experience does not suggest that industrial schools can train foremen, as such, economically. Young people from 14 to 20 years of age can hardly be selected with reference to their native ability to serve as foremen. Hence, training in the special lines of knowledge required for foremanship would be largely wasted. On the other hand, when skilled workmen are selected after several years of experience for positions of foremanship they often find themselves handicapped for lack of the technical knowledge which foremen should have.

(*c*) Probably the need should be met by (1) a systematic course, offered to all alike, toward the occupational pursuit itself, followed by (2) opportunities at evening schools and short courses for workers who have had a few years' experience in the industry, further to qualify themselves if they desire.

Problem 3. To what extent shall prolonged courses of industrial training be offered to girls in industrial and other occupational fields, who, in the main, will spend but from four to seven years in the occupation, after which they will take up home making?

The census of the United States shows that at the present time there are employed in this country a very considerable number of girls from 14 to 20 years of age. It is well known that the large majority, probably at least 90 per cent of these in the wage-earning callings, will take up homemaking as a career between the

ages of 20 and 27 years. The problem of the industrial training of these, therefore, involves, on the one hand, comparatively short courses of training, and, on the other, courses which will produce the maximum degree of efficiency in early stages.

Problem 4. Are there callings in industrial fields intermediate between those of a strictly professional nature, such as engineering, and those of a strictly trade nature, for which a large degree of technical instruction, as distinguished from practical training, is desirable?

It is sometimes alleged that there are such technical fields, for which, for example, the technical training offered in some of our high schools might be suited. Draftsmanship is sometimes alleged as an example, while in other fields such occupations as assaying, computing, and the like, may serve as examples. No sufficient anaylsis of these possibilities has yet been made.

Problem 5. What, at any given stage of vocational training for the industrial occupations, should be the proportion of time and energy of the pupil given, respectively, to technical instruction and to practical training?

Extreme and opposed examples of the problem under consideration are the following: (1) In the making of the machinist, a boy beginning at the age of 14 might devote his first two years very largely to such technical studies as drawing, mathematics, mechanics, and shop exercises, together with shopwork and shop English, and on the other hand give a minimum amount of attention to productive shopwork of a thoroughly practical nature. Between his sixteenth and eighteenth years the proportion of time given to his shopwork might be very greatly increased, with a diminution of the amount of attention given to technical work.

On the other hand, a program of training might be devised by which during the first year he might give from 60 to 80 per cent of his time to productive shopwork, with relatively only a small amount of technical instruction related to it. In his later years the proportion of time given to shopwork might be diminished, and the proportion of time given to technical instruction might be greatly increased.

The problem involved is not one merely for a given individual, but one which shall meet the requirements of the largest proportion of individuals as these present themselves for training. The first program might be the best for the person, if he could be found, who possesses inherent qualifications for foremanship; but it might prove exceedingly wasteful for that large majority of prospective workers in iron and steel who have little capacity for abstract thinking. The second program might prove much the better for the so-called "concrete-minded" people, and might also prove most effective for

those who were capable of surviving four or more years of training as given.

VI. PROBLEMS OF COMMERCIAL EDUCATION.

The chief problems found in commercial education at the present time, apart from those involving its relationship to general education, are found in connection with the unanalyzed character of the occupations, from the standpoint of programs of commercial training.

Problem 1. To what extent should commercial occupations other than those of (*a*) accountancy and bookkeeping, (*b*) stenography and typewriting, be differentiated from the purpose of vocational education?

Statistics show clearly that in the commercial world approximately 80 per cent of the workers are found in fields of salesmanship, etc., as against 20 per cent in the specialized fields of accountancy, and stenography and typewriting. For the former occupations, however, little or no systematic vocational education is yet offered, in the main because requirements of these occupations that might be met by school vocational training have not been defined.

VII. PROBLEMS OF HOMEMAKING EDUCATION.

The two chief problems connected with homemaking education at the present time are (*a*) those connected with the more effective coordination of that education with the home activities of the pupils and (*b*) those connected with the age at which it is efficiently practicable to begin systematic vocational homemaking education.

Problem 1. To what extent and under what conditions in a program of systematic vocational homemaking education can cooperation with the home be secured, and the equipment and facilities of the home be utilized for purposes of practical training?

(*a*) Every girl seeking a homemaking education must either live at home, in a school dormitory, or under other conditions involving a close contact with the various operations for which she is being trained. An efficient program of vocational homemaking education will involve the extensive use of the facilities thus offered.

(*b*) The problem presents different aspects, according as the vocational day school or the vocational evening school is under consideration. The principle is the same in both cases, however.

Problem 2. At what age is efficient homemaking education most practicable?

It is quite probable that there must be differentiation of groups for homemaking education, according to age as affected by the

occupations followed. For example, it may be doubted whether girls who from 14 to 21 years of age will be wage earners in occupations not related to the home, and who will be either living at home as boarders or in boarding houses, can efficiently respond to vocational homemaking education until somewhat late in their wage-earning careers. Again, when conditions of caste shall have been so changed that home employment on a wage basis shall be attractive, systematic vocational education for this might well be begun at 14 or 15 years of age. In the case of girls not contemplating wage-earning careers, but who design to remain at home, systematic vocational education might well take place during the high-school period.

VIII. PROBLEMS OF AGRICULTURAL EDUCATION.

Some examples now exist of successful programs of agricultural vocational education wherein the home farm is successfully combined with the school for instruction and for the direction of practical work. The two problems at present most pressing are (1) the provision of opportunities for practical training for city boys, and (2) the problem of combining secondary vocational agricultural education with preparation for higher institutions for the study of agriculture.

Problem 1. Under what conditions can boys living under urban conditions be provided with facilities for that portion of vocational agricultural education connected with practical work?

Experiments are being made in the direction of renting vacant land adjacent to cities for this purpose and putting boys in charge of their work on a project basis.

Problem 2. To what extent is it practicable for boys in the course of receiving a vocational agricultural education properly to qualify themselves for an agricultural college?

Obviously the requirements of an efficient vocational agricultural education are defined by the conditions of successful farming. It is not yet clear as to what should constitute the minimum requirements for admission to the agricultural college. Probably the college should distinguish in its work between degree work and courses of agriculture of a practical nature.

IX. PROBLEMS OF THE ADMINISTRATION OF VOCATIONAL EDUCATION.

The effectiveness of any form of vocational education depends largely upon the degree to which those directing it comprehend and respond to the practical requirements of the occupations for which training is being given. There arise, therefore, (*a*) problems as to

obtaining teachers who have had experience in the occupation for which training is being given; (*b*) problems of keeping these teachers in intimate contact with the practical requirements of these occupations; (*c*) problems of maintaining or providing, in connection with the executive authority in charge of the schools, specialists in vocational education; and (*d*) problems of providing, either in the legislative authority in charge of the schools or in an advisory relationship, representatives of the fields for which training is being given.

Problem 1. To what extent and under what conditions can teachers in vocational departments be equipped with practical experience obtained through actual participation in the callings for which they are giving education?

(*a*) Experience seems to prove that effective vocational education can only be given by persons who have had sufficient experience in a practical capacity, in a particular occupation, to enable them to succeed on a commercial basis.

For example, where normal schools undertake to train teachers for successful teaching (and not merely to teach prospective teachers certain subjects of study) experience seems to show that such teachers must themselves have been successful in the field of practical work. In medical colleges it is rare to find successful teachers who have not been commercially successful in practice. The best engineering teachers are those who have served some years at commercial work. In such trades as plumbing, pattern making, and others it is now agreed that a successful teacher must himself have reached a stage where he could readily procure profitable employment. The situation is not clear as regards commercial and agricultural teachers, but doubtless the same principles apply in these fields, as well as in homemaking.

(*b*) Granting the necessity of a considerable amount of practical experience on the part of teachers, the following are methods by which it could be obtained in conjunction with suitable training in the art of teaching: Vocational schools might take as teachers only persons who have already demonstrated their capacity in the world of practical effort, giving them in greater or less degree, just prior to their entrance on teaching, such training in the art of teaching as is practicable.

This method has been followed in the past by medical colleges, theological schools, and to some extent, engineering colleges and law schools. It is now followed by trade schools, and to a small extent, by schools of agriculture.

(*c*) A person seeking to become a teacher in a vocational field might take pedagogical courses, followed by a certain amount of practical experience as a prerequisite before taking up teaching.

This is the prevailing method in normal schools and in some engineering schools.

(*d*) A course of training might be devised whereby the prospective teacher would first take a course in a school looking toward teaching, followed by one or more years of practical participation in commercial work, this to be succeeded by a definite period of study of the art of teaching, preliminary to taking a teaching position. This method is now being proposed as a basis for the training of teachers of commercial subjects, etc.

Problem 2. To what extent and by what means shall teachers in vocational schools be required to keep in close contact with the occupational fields for which they are giving training?

It is probable that in fields like industry and agriculture and others where changes are taking place efficiency can be produced only by strongly requiring that teachers shall not only observe but actually participate, on a commercial basis, from time to time in the work in fields in which they are giving training. The most available means to this end would be periods of leave given from the school, during which teachers would participate in such work. This is now found in some engineering fields.

Problem 3. To what extent and by what means shall specialized direction be provided in the executive administration of vocational education?

(*a*) The problem is one affecting (1) the headship of a department; (2) the directorship of a vocational school; (3) the general supervision of vocational education in an administrative unit, such as a town or city; and (4) the administrative supervision of vocational education on behalf of the State, or other large unit of administration.

(*b*) It is assumed that the headship of a department must be in the hands of one who is a specialist himself in the occupation for which training is being given.

(*c*) The directorship of a large vocational school having several departments will probably not be in the hands of a specialist in any one department, but rather in the hands of one who is a pedagogical expert in many lines and a good administrator. Eventually, such a position will probably be filled by promotion from headships of departments, such selection being made on the basis of natural ability for an administrative position.

(*d*) There are good grounds for believing that in each city, or other administrative unit having many vocational schools, there should be an assistant superintendent specializing in the field of vocational education, including thereunder industrial, commercial, homemaking, and agricultural work offered, but not including professional. Whether he should also have supervision of the practical

arts work as a phase of general education or when offered prevocationally is doubtful.

(e) Similarly, where the administration of vocational education is supervised on behalf of the State there should be organized a separate department, dealing exclusively with vocational education.

Problem 4. To what extent and under what conditions shall representatives of the various vocational fields participate in the lay administration of vocational schools?

(a) It should be assumed that every single vocational department in a system should feel the influence of representatives of laymen in the occupational field concerned (including both employers and employees, where these distinctions are clearly defined).

(b) Obviously, it is impracticable to include laymen in this capacity in the school committee or board itself without making the latter unduly large. It may be assumed that a layman from one occupational field has no more capacity to assist in the administration of vocational education in another than any other layman.

(c) Experience seems to demonstrate that the more effective course is to place all vocational schools under the administration of the regularly constituted school authorities, because these are supported by public money, and to provide for each distinctive department a small advisory committee for the activity of which the department head shall be primarily responsible.

APPENDIX.

DIGEST OF LAWS OF STATES THAT PROVIDE STATE AID FOR A MORE OR LESS STATE-WIDE SYSTEM OF VOCATIONAL EDUCATION.

INDIANA.

1. *Units of organization* are cities, towns, and townships.
2. *Types* are separate schools, regular day schools, part-time day, and evening schools or classes.
3. *Compulsory education* in part-time day schools, ages 14 to 16, 5 hours per week. But only when local communities have first established the school. The education is not compulsory upon all, as is the case in Wisconsin.
4. *Approved* by State board of education.
5. *Restricted* to such courses in part-time schools as are supplementary to regular employment.
6. *Established and maintained* by regular school authorities.
7. *Local board of inspection* is appointed by school board, ratified by State board of education. Three members suggested for each separate vocation taught.
8. *State reimburses* local communities maintaining regular day, part-time, and evening vocational schools and classes to the extent of two-thirds of net cost of maintenance, less tuition collected.
9. *State reimburses* local communities to extent of one-half amount expended for tuition.
10. *Age limits* are, for regular day and part-time day schools, 14 to 25.

MAINE.

1. *State aids* elementary schools teaching manual training and domestic science to the extent of two-thirds of the teacher's salary, not to exceed $800 for each teacher.
2. *Approved* by superintendent of public instruction.
3. *State aids* secondary schools providing instruction in agriculture, domestic science, and mechanic arts to the extent of two-thirds of cost of instruction, but not to exceed $500 to any district for any one year.
4. *State aids* certain selected vocational schools teaching agriculture, domestic science, manual arts and trades, to the extent of two-thirds of the cost of instruction, but not exceeding $2,000 for any one district.

MASSACHUSETTS.

1. *Units of organization* are counties, cities, and townships.
2. *Types* are regular day, part-time day, and evening schools or classes.
3. *Compulsory education* in part-time day schools, ages 14 to 16, 5 hours per week. But only when local communities have first established the school. The education is not compulsory upon all, as is the case in Wisconsin.

4. *Approved* by State board of education.
5. *Restricted* to such courses in part-time schools as are supplementary to regular employment. Exception: Vocational courses for women in evening classes do not have to be supplementary to regular employment.
6. *Established and maintained* by regular school authorities or by *independent boards.*
7. *Local board of inspection* is appointed by school board and ratified by State board of education. Three members suggested for each separate vocation taught.
8. *State reimburses* local communities maintaining regular day, part-time, and evening vocational schools and classes to the extent of (*a*) one-half net cost of maintenance less tuition collected, (*b*) two-thirds net cost of maintenance for vocational courses in regular high schools maintaining agricultural courses.
9. *State reimburses* local communities to extent of one-half of amount expended for tuition.
10. *Age limits* are, for regular day and part-time day schools, 14 to 25 years; for evening schools, 17 or over.

NEW JERSEY.

1. *Units of organization* are county, joint county, districts, or union of districts.
2. *Types* are regular day, part-time day, and evening schools or classes.
3. *Not compulsory.*
4. *Approved* by State board of education.
5. *Restricted* to such courses in part-time schools as are supplementary to regular employment. Exception: Vocational courses for women in evening classes do not have to be supplementary to regular employment.
6. *Established and maintained* by regular school authorities.
7. *No local boards of inspection.*
8. *State reimburses* local communities maintaining regular day, part-time, and evening vocational schools or classes to the extent of one-half of net cost of maintenance, but not to exceed $10,000 for any district, county, or joint district.
9. *Tuition reimbursed* to local communities to extent of $25 through another act.
10. *No age limitation.*

NEW YORK.

1. *Units of organization* are cities and districts.
2. *Types* are regular day, part-time day, and evening schools or classes.
3. *Not compulsory.*
4. *Approved* by commissioner of education.
5. *Not restricted.* (See (5) other States.)
6. *Established and maintained* by regular school authorities.
7. *Local boards of inspection* are appointed by school board and ratified by State board of education. Two members suggested for each separate vocation taught.
8. *State reimburses* local communities maintaining regular day, part-time, and evening vocational schools and classes to the extent of (*a*) one-half of net cost first teacher, not to exceed $1,000; (*b*) one-third of salary of all additional teachers. Provision is made for a pro rata distribution of part-time teachers in evening, part-time, or other schools.

9. *State reimburses* local communities through high-school act for tuition expended.
10. *No age limitations.*
11. Minimum of 15 pupils required for formation of class.

PENNSYLVANIA.

1. *Units of organization* are districts or joint districts.
2. *Types* are regular day, part-time day, and evening schools or classes.
3. *Not compulsory.*
4. *Approved* by State board of education.
5. *Restricted* to such courses in part-time schools as are supplementary to regular employment. Exception: Vocational courses for women in evening classes do not have to be supplementary to regular employment.
6. *Established and maintained* by regular school authorities.
7. *Local board of inspection* is appointed by school board and ratified by State board of education.
8. *State reimburses* local communities maintaining regular day, part-time, and evening vocational schools and classes to the extent of two-thirds of cost of instruction, not to exceed $5,000 in any one district for any one year.
9. *State reimburses* local communities for tuition to extent of $25 per child through other act.
10. *No age limitations.*

WISCONSIN.[1]

1. *Units of organization* are school districts.
2. *Types* are all-day, part-day, and evening schools or classes.
3. *Compulsory education* in part-time day, ages 14 to 16, 5 hours per week.
4. *Approved* by the State board of industrial education, consisting of 9 members—3 employees, 3 employers, and 3 educators.
5. *All cities with 5,000 or more inhabitants* required to provide boards for industrial education; these boards to be appointed by the local boards of education, and to consist of 6 members—2 employees, 2 employers, the superintendent of schools, and the high-school principal.
6. *State aid provided* for four types—industrial, commercial, continuation, and evening schools.
7. *State reimburses* local communities maintaining above types to the extent of one-half expense of instruction, up to $3,000 for each school maintaining all four types, but not to exceed $10,000 to any one community.
8. *Employers must pay wages* to "permit pupils" for the five hours spent in continuation schools.

[1] The Wisconsin laws covering this topic were not available, so this digest was gleaned from various secondary sources.

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