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REPORT

OF THE

Michigan State Commission on Industrial and Agricultural Education.

*To the
Governor, Superintendent of Public Instruction,
and Commissioner of Labor.*

*Lansing,
December, 1910.*

PUBLISHED BY THE COMMISSION.

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REPORT
Michigan State Commission on
Industrial and Agricultural
Education
GIA
W. W. Bishop

APR 20 1911

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LETTER OF TRANSMITTAL

*To His Excellency, the Governor of the State of Michigan;
the Superintendent of Public Instruction; the State Com-
missioner of Labor:*

Pursuant to the provisions of Act No. 228 of the Public Acts of 1909, the commission appointed by Governor Fred M. Warner to investigate the conditions of elementary, industrial and agricultural education in the State of Michigan begs leave to present the following report.

Respectfully submitted,

WALTER H. FRENCH, Chairman.

Lansing, Michigan, December 1, 1910.

INTRODUCTION AND HISTORICAL STATEMENT.

At the annual meeting of the City Superintendents' Association, held in Lansing, April 21, 1909, a resolution was adopted urging the legislature, then in session, to provide for the appointment of a commission whose duty it should be to investigate the subjects of industrial and agricultural education in the state and make a report to the governor and the legislature, with recommendations for statutes which would improve existing conditions. The resolution above referred to was duly presented to the governor and the members of the legislature, and on April 27, 1909, Senator Taylor introduced senate bill No. 310, which was enacted into law as Act No. 228 of the Public Acts of 1909, which is as follows:

"AN ACT

To provide for a State commission on industrial education, including elementary training in agriculture.

The People of the State of Michigan enact:

Section 1. The Governor of the State of Michigan, by and with the consent of the Senate, is hereby empowered to appoint a commission of not less than five nor more than seven members, to be known as the Michigan Commission on Industrial and Agricultural Education.

Section 2. This commission, immediately after appointment, shall organize by choosing from its own membership a chairman and a secretary.

Section 3. It shall be the duty of this commission to make a careful study of the conditions of elementary, industrial and agricultural education, whether under public school or other auspices, including the study of conditions of labor as they affect children between the ages of fourteen and eighteen; and it shall further be the duty of this commission to present a report showing these conditions, with recommendations for such a plan of elementary, industrial and agricultural training in connection with the public schools of the state as shall, in their judgment, best meet the conditions shown to exist; this report to be rendered in triplicate to the Governor, the State Superintendent of Public Instruction and the State Commissioner of Labor, on or before January one, nineteen hundred eleven.

Section 4. The members of this commission shall serve without pay, and the commission shall maintain its organization until July one, nineteen hundred eleven, when said commission shall expire by limitation, unless renewed by subsequent act of the Legislature."

Pursuant to this resolution, and shortly after the adjournment of the legislature, Governor Fred M. Warner appointed a commission of seven members, as follows:

WELLINGTON R. BURT, SAGINAW;
SHATTUCK O. HARTWELL, KALAMAZOO;
H. E. KRATZ, CALUMET;
GEORGE A. McGEE, CADILLAC;
CHARLES H. JOHNSON, DETROIT;
EBER W. YOST, TRENTON;
WALTER H. FRENCH, LANSING.

The members of the commission, having received formal notification of their appointment from the Governor, met in Saginaw on October 28, and elected Walter H. French as chairman and Shattuck O. Hartwell as secretary.

The commission decided that the method of investigation should include personal visits and the use of questionnaires.

The entire commission visited the Burt Manual Training School at Saginaw and examined carefully the methods, equipment and buildings, and also gave especial attention to the work of the trade school, then recently instituted. After having examined carefully the manual training and trade schools, the commission held a regular session and proceeded to select subcommittees who should consider special phases of the work to be done. The committees were as follows:

Industrial and Trade Schools—S. O. Hartwell, G. A. McGee, W. R. Burt, H. E. Kratz.

Child Labor Conditions—Charles H. Johnson, E. W. Yost.

Agricultural Education—W. H. French, W. R. Burt, E. W. Yost.

Rural Education—E. W. Yost, W. H. French, S. O. Hartwell.

The chairman and secretary presented the forms for the several questionnaires which were to be used, and these were approved by the commission.

At the meeting of the State Teachers' Association in 1909 the Association voted to place at the disposal of the commission the sum of five hundred dollars to be used for necessary expenses for traveling and the printing of the report. Friends interested in agricultural and industrial education added five hundred dollars, so that the commission has had a fund of one thousand dollars for necessary expenses, which have been kept within that sum.

Questionnaires were sent to superintendents of schools, county commissioners, rural teachers, trade schools and technical schools and through them a large fund of information was secured.

The several committees appointed proceeded with their investigations. The committee on agricultural education visited county agricultural schools in Wisconsin, Michigan and Minnesota; also visited the state secondary schools of agri-

culture in Minnesota. The members of the committee on industrial education visited a large number of schools, including the Hackley Manual Training School, Muskegon; the public schools of Cincinnati, Ohio; Rochester, N. Y.; Worcester, Fitchburg and Springfield, Mass., and the Stout Manual Training School, at Menomonie, Wis.

In July, 1909, Mr. H. E. Kratz, of Calumet, having decided to leave the state, placed his resignation in the hands of the Governor, and the Governor immediately appointed Superintendent Fred A. Jeffers, of Painesdale, to take his place.

The commission has been materially assisted by friends in other states and by means of public documents published in Michigan and elsewhere. The greatest courtesy has been shown visiting individuals and committees, and for all these kindnesses the commission desires to make grateful acknowledgment. We wish especially to extend our thanks to Superintendent E. C. Warriner, of Saginaw, for many suggestions, and for the paper on German industrial education which is published as a part of this report. We desire to make special acknowledgment, also, to Superintendent Perry, of the Milwaukee School of Trades; Mr. Samuel F. Hubbard, of Boston; Hon. L. D. Harvey, of Menomonie, Wis.; Prof. D. D. Mayne, of St. Anthony's Park, Minn.; Mr. Lewis A. Wilson, of Rochester, N. Y., and Dr. F. A. Manny, of Kalamazoo, for information and helpful suggestions given.

The commission has not attempted an original study of the general questions of agricultural and industrial education. In the intense discussion of the last five years, some of the fundamental questions have been settled. We have made liberal use of the studies and experience of other committees in other states, with one aim in view—namely, to present fairly the present status and the present needs of the State of Michigan in the matter of agricultural and industrial training.

Nor do we claim that this is a final word on industrial training in Michigan. We are now in a transition stage in educational matters, especially as relating to public education. This condition affects not only Michigan, but the entire country. The period in which the investigation could take place has been limited, and subjects which might have been touched upon we have been unable to reach for lack of time. We respectfully submit our findings, and urge the enactment of such laws as will encourage and hasten a readjustment of public education to meet the growing needs of an agricultural and industrial state.

WALTER H. FRENCH,
SHATTUCK O. HARTWELL,
WELLINGTON R. BURT,
GEORGE A. McGEE,
FRED A. JEFFERS,
CHARLES J. JOHNSON,
EBER W. YOST, Commission.

DEFINITIONS, CONCLUSIONS AND RECOMMENDATIONS.

I. DEFINITIONS.

A difficulty at the present stage of discussion in this branch of education is the varying nomenclature and the consequent looseness in the use of terms. Farming is as much an industry as are the trades, but present usage has so narrowed "industrial education" that the term does not include agricultural education. We have endeavored in this report to use each of these terms in the specific and narrower sense. In regard to different kinds of schools also there is a vague terminology. We shall hold to the following definitions:

Elementary industrial or agricultural schools or courses are those established for pupils below sixteen years of age, admission to which does not require completion of the regular elementary grades. Most of the so-called vocational schools and short courses would come under this heading. Manual training schools as at present organized are not included in this definition.

A high school is a school having a four years' course of study above the eighth grade.

Secondary industrial, agricultural or trade schools are those equivalent in courses or age-demands to the ordinary high schools—that is, they either cover with a four years' course the age period of high school students (14 to 18); or, if courses are shorter and intensive, they cover the latter portion of the high school period (from age 16 to 18 or 19).

Continuation schools or courses are part-time schools or courses designed to give workers, old or young, who are already established in the industries, a better knowledge of the special industry and its relations to other activities. These schools may be either day or evening schools, though under present conditions in this country day schools of this type must be slow in development.

The following definitions are taken from the Report of the Committee on the Place of Industries in Public Education (N. E. A., July, 1910):

1. "The secondary technical school, or the technical high school, is a school of secondary grade having the distinct purpose of preparing its pupils for industrial leadership—that is, for positions in industrial life requiring skill and technical knowledge and of greater importance and responsibility than those of the skilled mechanic.

2. "The trade school and the preparatory trade school are schools which have for their definite purpose the preparing of boys

or girls for entrance to the skilled mechanical trades and which deal with their pupils during a briefer course and allow for earlier preparation for practical work than the technical high school. Such schools place their greatest emphasis upon practical handwork instruction under conditions resembling as closely as possible those prevailing in commercial practice."

The last definition will be somewhat modified, as shown later in our discussion, since we would add that the reasons for establishing preparatory trade schools seem to relate rather to general pedagogy than to the trade point of view. Hence we shall preferably use the term elementary vocational schools.

II. CONCLUSIONS AND RECOMMENDATIONS.

1. In view of the fact that in many rural districts of the state the school population of single districts is so small and fluctuating that the best school conditions cannot be maintained, we believe that a consolidation of these districts or the organization of the districts in a geographical township into one district will much better conserve educational interests, give equal educational privileges and also tend to economy in administration; therefore the Commission would respectfully recommend the enactment of a township district law for the entire state with the provision for at least one high school in each township.

2. The Commission would recommend the enactment of a law providing that a high school within the meaning of the statute shall consist of four years of work beyond the eighth grade.

These recommendations are made because we believe these things are needed to secure more favorable conditions for success under the recommendations which follow.

3. The Commission would respectfully recommend the introduction as soon as possible of courses in agriculture, manual training, and home economics in all high schools of the state.

4. The Commission recommends that the general school laws be so amended that any village or city having a population of five thousand or more may establish trade departments in connection with the public school system, also may provide for continuation schools.

5. We recommend that a law be enacted providing for the certification of all teachers of agricultural and industrial subjects.

6. State supervision of all agricultural and industrial courses in the public schools should be provided by law.

7. We recommend the enactment of a law providing for a limited amount of state aid for schools which introduce high school courses in agriculture and home economics, or trade schools, or continuation schools, according to the following

general plan; and that this state aid should not be more than \$500 for each course, or teacher employed.

a. The law granting state aid should provide that the total amount of state aid under the law should not exceed, for the first year, \$30,000, for the second year \$50,000, nor in any subsequent year \$100,000.

b. The apportionment of state aid between courses in agriculture and home economics on the one hand and industrial courses on the other should be equal.

c. Schools applying for state aid must be duly certified to the Auditor General by the Superintendent of Public Instruction, the order and priority of certification to be determined by statute.

d. Any high school in the state in any township or city of less than 20,000 in population may be certified for state aid for courses in agriculture and home economics to the following amounts, viz.: five hundred dollars for the first teacher employed and two hundred and fifty dollars for each other teacher employed, provided that no school district shall receive an allowance for these courses of more than one thousand dollars in all.

e. Any city or village having a population of 5,000 or more shall be entitled to state aid for establishment of one or more of these schools, viz.: (1) an elementary industrial school; (2) a trade school for boys 16 years or more of age; (3) a trade school for girls 16 years or more of age. Said city may be duly certified to receive through its regular board of education state aid to the amount of five hundred dollars for the first instructor and two hundred and fifty dollars for each other instructor employed, up to a limit of four instructors in all for these schools or departments.

f. Cities with a population of 20,000 or more may in the same way be certified for continuation schools of trades up to a limit of \$1,000 for three teachers employed in said school.

g. Any schools drawing state aid under this law should, for the purposes of this law, be under the supervision of the state department of education, and for these purposes an additional deputy superintendent should be provided.

The reasons for the recommendations here made are set forth in the more detailed reports of the sub-committees.

W. H. FRENCH,
S. O. HARTWELL,
W. R. BURT,
G. A. McGEE,
F. A. JEFFERS,
C. H. JOHNSON,
E. W. YOST.

Commission on Elementary Industrial and Agricultural Education.

REPORT OF SUB-COMMITTEE ON LABOR CONDITIONS.

C. H. JOHNSON, CHAIRMAN.

The act establishing this commission included among its duties "a careful study of the conditions of labor (in Michigan) as they affect children between the ages of fourteen and eighteen." The sub-committee to whom this part of the work was assigned found it impossible fully to meet its task for several reasons.

In the first place, the funds at the disposal of the sub-committee were not sufficient to secure the employment of expert assistants, and for a satisfactory study of this sort the help of trained investigators is essential, unless the members of the committee can give their entire time to the task. In the second place, such information as could be secured through the State Department of Labor, school officials, etc., was almost wholly regarding boys and girls between fourteen and sixteen years of age. And finally the necessity of relying largely on volunteer helpers in securing data made any complete canvass of the situation impracticable.

In view of these limitations the committee decided to undertake a few typical studies as to child labor in certain cities. The data gathered are suggestive but much less complete than was desired. We wish, however, to express thanks to the State Department of Labor for many courtesies and for co-operation in gathering material. Questionnaires like the following were sent to the factory inspectors, who were asked to interview five or more children in each of the factories where children were employed:

LABOR CONDITION OF BOYS AND GIRLS 14 TO 16 YEARS OF AGE.

1. Date
2. Name of firm employing children.....
3. Town where located.....
4. Goods manufactured or handled.....
5. Number.....of boys employed.....
6. Average weekly wages.....
7. Number of girls employed.....
8. Average weekly wages.....

INDIVIDUAL CANVASS.

Name.....Native....Foreign....Last School attended....
If trade was taught in school would you have continued?....
Has your school fitted you for any particular line of work?....

The careful returns made by Inspector Sylvester Greusel for Kalamazoo, Inspector Katherine Heath for Detroit, and Inspector Frank Wood for Saginaw have made possible some type studies for those cities.

The report of the Department published in 1910 gives the following figures for children between the ages of fourteen and sixteen found at work :

	Boys.	Girls.	Total.
1908	2,384	1,661	4,045
1909	2,746	1,407	4,153

The figures for the forty leading cities of the state for 1909 are: boys 2,334, girls 1,340, leaving remainders for the rest of the state of 412 boys and 67 girls. It is interesting to observe that the 1909 figures for Detroit and Grand Rapids are, respectively, 1,493 boys and 1,014 girls, and 213 boys and 107 girls employed. For the cities of Calumet, Houghton and Iron Mountain no boys or girls under sixteen are reported. In the list of forty cities just mentioned we do not find such towns as South Haven, Frankfort, Hillsdale, Coldwater and Niles. This simply means they are included in the balance of the state, not that inspection was lacking. From these statements two conclusions seem justifiable. Factory inspection seems to be most carefully done in the larger cities, and for the whole state we have no reliable figures to show the number of children between fourteen and sixteen either at work or out of school.

We may secure a rough estimate from the educational statistics for 1909. (Pp. 165-166, Report of State Superintendent of Public Instruction, 1910.) These show the 1909 school census in Michigan to be 755,935, public school enrollment 555,687; estimated enrollment, private and parochial schools, 60,834, and per cent of attendance (public schools) 75, for an average of 8.9 months. The school census covers the fifteen-year period from age 5 to age 19, inclusive. The proportion of these enrollment figures to be allotted to any two-year period would then be 100,792, 76,092, 8,112, respectively. On average figures, therefore, 16,588 children fourteen and fifteen years of age are apparently not attending school. But we know that average figures are unsafe; we must note a correction of these for the evident fact that the number of children of age fifteen is smaller than the number of age five or age six, hence the fraction $2/15$ gives us too large an estimate. But, on the other hand, the tendency to leave school acts much more heavily for the years above thirteen. We conclude, then, that a conservative estimate of the number of children between the ages of fourteen and sixteen not in school is from 10,000 to 12,000. For the state this compares favorably with the figures given for Massachusetts by

the Douglas Commission of 1905 in their well known study on this point (25,000; see p. 25, Senate Doc. 349, Mass., 1906). It should compare favorably, for Michigan is not so thoroughly organized in industrial lines and our limit for compulsory school attendance is sixteen years, while in Massachusetts the limit is fourteen years; and we believe that the compulsory education law is fairly enforced throughout the state. But at best the fact that 5,000 children a year leave school, give up the chance for further training, and without preparation enter the ranks of labor—or else become idlers—is a fact worthy of serious attention.

When we consider wages we shall doubtless find the figures at hand more nearly true for average conditions. The Department of Labor gives the average weekly wage for boys in 1908 as \$5.04, in 1909 \$5.24; while girls earned respectively \$4.14 and \$4.26. The investigation in three cities for 1909 showed the lowest shop wages, for boys, \$4.50, the highest \$8.10—the average \$7.81 in Detroit, \$5.60 in Kalamazoo, \$5.43 in Saginaw. For girls the lowest shop wage was \$4.80, the highest \$8.50; and the average in Detroit \$6.23, in Kalamazoo \$6.15, and in Saginaw \$5.14.

As has been said, we have for Michigan no established figures for the years sixteen to eighteen, but so far as we have learned conditions, from observation and through conference with laborers and employers, we find the evidence sustaining the facts shown in other states. There is, for those children who have started as unskilled toilers at fourteen or fifteen, very slight chance to secure, as adults, either skilled labor or a reasonable wage advance. Under present conditions of industrial training in this state they are predestined to mediocrity of work and wage.

In the typical studies mentioned, which will be found in Appendix A, we asked the opinions of the children themselves regarding the training for industrial work received through the schools. The information is too slight for us to draw definite conclusions. This much may be said. The three cities mentioned are not only industrial centers but have well developed manual training departments in their public schools. The total number of boys reporting was 166, of girls 653. Of these, 54 boys and 82 girls reported valuable assistance gained through the school for their manual labor. Thirty-two boys and 70 girls declared that they had not been fitted for any occupation. The rest apparently were silent, except that 55 boys and 62 girls declared that they would have remained in school if they could have secured trade instruction. From this it seems evident that in these cities the present school instruction does not look strongly toward special efficiency in trades. If this is a fact for cities with good manual training schools it must be a fact of great weight

in those communities in which no such schools are provided. Several investigations have been made on the money value of trade and technical training. We quote one of them:

“James M. Dodge, president of the American Society of Mechanical Engineers, sets forth the value of a trade school education. Mr. Dodge urges that an untrained boy of sixteen, in good health, represents a potential value of \$3,000.00 on entering a trade school or shop—that is, he is worth to his employer 5 per cent of \$3,000.00, or \$150.00 a year; that the shop taught lad in nine years has increased this potential value at the rate of \$1,300.00 per annum, while the trade-school man’s investment in himself has been at the rate of \$2,100.00 per annum. The untrained lad will earn \$15.00 per week at 24 years of age (and only 5 per cent of this class ever earn any more), while the graduate of the trade school reaches this earning capacity between 20 and 21, and is getting \$20.00 a week before he is 24, with unlimited possibilities for the future. Mr. Dodge urges, backing his arguments by facts and figures, that the best investment any boy can make is to ‘invest himself’ by increasing his own potential value. This result, Mr. Dodge points out, is gained most thoroughly and effectively by training.”

(“The Money Value of Training,” St. Nicholas, Nov., 1904. Quoted in Gillette, Vocational Education, p. 33.)

Such computations are verified by experience. The record for twenty-five years made by the Hebrew Technical Institute of New York City is convincing. This school takes boys of fourteen for a three years’ course. “It aims to train them for the mechanical and technical trades in such a way as will give them a good preparation for such positions as skilled artisans, pattern makers, foremen in woodworking and iron-working shops and in the various electrical industries, and as draftsmen in architects’ offices.”

At the twenty-fifth anniversary of the school, in 1909, these facts were shown:

	No. living.	Av. weekly income.
Graduates employed 1 year (class 1908).....	81	\$ 7.25
Graduates employed 5 years (class 1904).....	62	18.00
Graduates employed 10 years (class 1899).....	27	29.00
Graduates employed 20 years (class 1889).....	16	40.00

The average wage of the graduates of more than ten years’ standing is \$38.58 per week.*

No such opportunities for industrial progress are at present given in Michigan. The boys and girls who leave school before they are sixteen years of age almost inevitably remain in the lower industrial classes. There has been little effort to train them industrially. We have seen this to be true so far as the school systems go. It is practically true for all the great industries. Manufacturers in every line complain that a large proportion of the men who come to them as journeymen are lacking in skill and mechanical knowledge. They have gained a bit of experience in one shop, gone to another and gained a

* For a complete table see Dean’s “The Worker and the State,” pp. 138-140.

bit more, and graduated from a short term of work in the third with the title of mechanic. It is only fair to say that the men themselves are often as troubled by these conditions as are their employers.

Occasionally a great industry will establish apprentice schools of its own. We know of only three such in Michigan—the apprentice schools of the Packard and Cadillac automobile companies in Detroit, and the Grand Trunk railway apprentice school at Battle Creek. These three schools prepare a few boys as draftsmen or machinists. In general terms, adequate training for this class of laborers has not begun. If our estimate of the number of children each year forced prematurely into the industrial ranks is correct, we believe that the need is evident of thorough planning for a training equivalent to the continuation schools of Germany.

The whole question of labor conditions deserves more thorough study. But we are sure that later investigation will only strengthen the conclusion that careful industrial training is demanded as a means of advancement for workers and as a matter of economy for the state.

REPORT OF SUB-COMMITTEE ON RURAL AND AGRICULTURAL EDUCATION.

W. H. FRENCH, CHAIRMAN.

The investigation of the subject of agricultural education has been made by special visitations of a sub-committee, together with questionnaires submitted to various agricultural schools and institutions. In many instances it has been found impossible to secure absolutely accurate information. This is particularly true in what may be termed the new field of high school agriculture.

We find five types of agricultural schools and institutions in the United States:

- (a) The college of agriculture and mechanic arts.
- (b) The state secondary school of agriculture.
- (c) The congressional district secondary school of agriculture.
- (d) The county school of agriculture.
- (e) Public high schools of agriculture.

There is another variety of agricultural school which conforms practically to the state type such as is found in certain schools in Tennessee and New York, sometimes called "attached schools."

The first kind may be called the college type; such institutions were established under the land grant acts of Congress and are generally known as the land grant colleges. Their special function has been to give instruction of college grade in agriculture and the mechanic arts, and the graduates of these institutions have become leaders in the agricultural and mechanical world.

The second type, which may be called state secondary schools, are either connected with the state school of agriculture, as at St. Anthony's Park, Minnesota, or attached to special preparatory schools, like Alfred University in New York. The purpose in the minds of those who manage this class of schools is to train farmers, and this may be said also of the congressional district type, found in Georgia, Alabama and Oklahoma.

The county type, as shown in the county schools of agriculture of Wisconsin and Michigan, are special secondary schools having a two-year course of study and admitting students from the eighth grade. The underlying principle of these schools is to bring instruction in elementary agriculture as close to the people as possible, to establish the fundamental principles of the various subjects and to train young men and women for a successful career on the farm.

In the public high school type of agricultural school we find several plans—one the introduction of a one-year course in elementary agriculture into the regular high school curriculum, as in Nebraska, Ohio, and some other states; the other the introduction of a course of study in agriculture consisting of four units which continue through the several grades of the high school as an elective subject. Such schools are found in Michigan, Minnesota, New York, and a few other states.

So much may be said by way of general introduction. The result of the investigation of the Commission by the use of questionnaires will be found in tabulated form in another part of this report.

STATE SECONDARY SCHOOLS.

The state secondary school of agriculture at St. Anthony's Park, Minnesota, together with the county schools of agriculture of Dunn, Marathon and Menomonie counties in Wisconsin, and Menominee county in Michigan, were visited by a sub-committee. The State School of Agriculture at St. Anthony's Park presents a three years' course of six months in each year for both young men and young women. The subjects offered include domestic science and domestic art and drawing for the women, and soils, crops, fertilizers, drainage, farm mechanics, live stock, dairying, entomology and horticulture for the men. The young women are allowed to take certain of the courses in dairying, horticulture and gardening, and every effort is made to make the work simple and practical according to the purpose above stated, which is to render such service as will produce intelligent farmers and farmers' wives. There are two other schools of similar character in the state of Minnesota. The general grade of instruction given is about midway between that of the college of agriculture and the county or public high school work in agriculture. The attendance at St. Anthony's Park during the current year is 500 young men and 200 young women.

The school opens late in the fall and closes early in the spring, the students returning to their own homes to practice the rules and theories which have been presented to them during the school year. No tuition is charged, but regular laboratory fees are required. The entrance requirements are elastic, but the young people are supposed to have completed the eighth grade and to be at least sixteen years of age.

This school at St. Anthony's Park is attached to the State School of Agriculture and State University and therefore is particularly well equipped for its work. The two other similar schools in Minnesota attempt to do the same grade of work, but of course have not the same opportunity and equipment. The work is entirely of a practical nature, and Dr.

Mayne, the head of this department, reports that a very large percentage of the boys return to farming as a permanent occupation. A few take special interest and continue their work in the regular collegiate course. It should be noticed in passing that schools of this character not attached to well equipped institutions must spend considerable sums for a plant and for equipment, otherwise the work would be limited.

The special committee had no opportunity to visit any of the congressional district schools, but from reports received from them we learned that they are elementary in character. Students are permitted to enter from the eighth grade and receive two years of instruction. These schools are fairly well equipped with apparatus and with trained instructors and are designed to prepare young men for all ordinary farming operations and to give them some insight into the science of agriculture so that they may be reasonably skillful in conducting the affairs of the farm. Typical courses of study such as are found in these schools are given in another part of this report and the character of the institution can be judged somewhat from them.*

COUNTY SCHOOLS OF AGRICULTURE.

The law authorizing county schools of agriculture in Wisconsin was passed in 1902. At first two schools were authorized and later the law was made general and the expense for supporting the school is borne both by the county and the state, the state paying four thousand dollars annually and the county the balance. The typical courses of study will be found in the appendix. At the present time there are but six of these schools in operation. The average attendance of boys ranges about thirty and the average attendance of girls slightly above this. The investigation showed that a large percentage of the boys come from the farms, while a large percentage of the girls come from the city or village where the school is located, the course for the girls being domestic science, domestic art and manual training.

The Dunn County School

located at Menomonie, was organized in 1902. The school population of the county is 7,000. The number of boys enrolled during the current year, 47; number of girls enrolled, 46. The entrance requirements are completion of the eighth grade and the minimum age sixteen years. The annual cost of this school is \$11,000, of which the state pays \$4,000 and the county the remainder. The school is nicely accommodated in a fine two-story building, which is equipped with a considerable quantity of apparatus. The value of the apparatus and equipment is estimated at \$10,000 and the value of the

* Appendix B, 1.

library at \$1,000. Besides laboratory equipment, this school possesses twelve well-bred cows and some other live stock. There are four instructors, two of whom are graduates of agricultural colleges and two are graduates of special technical schools; these latter instructors have charge of the manual training and domestic science. The present value of the entire plant is estimated at \$36,000. There is no land connected with the school, but negotiations are under way to secure a small farm. The length of the course is two years of thirty-two weeks each. During the past eight years nearly two hundred students have been graduated from the school.

In addition to the regular agricultural subjects, some instruction is given in English, arithmetic, bookkeeping, history, physics, and chemistry. Twenty of the students during the current year are non-residents of Dunn County. The expense per student for board and room runs from \$3.50 to \$4.50 per week. The manual training shop is equipped with tools and benches and the work is confined to practical exercises. A course in blacksmithing is given during twenty-four weeks, two hours a day. The average age of the present enrollment is nineteen years. During the winter months each year a short course of several weeks is given for the farmers of the county. These short courses will include dairying, poultry husbandry, corn raising, and domestic science. Special lecturers are employed for this work.

Marathon County Agricultural School, Wausau, Wis.

This was the first school established under the law of Wisconsin authorizing county schools of agriculture. The school is located on a plat of ground containing about seven acres. The school population of the county is about 15,000 and there are sixteen villages and cities in the county maintaining high schools. The number of boys enrolled, 17; the number of girls, 32. The ages of students range from fourteen to twenty. The annual cost of this school is about \$7,000 and its revenues are derived from the same sources as the Dunn county school. The value of the plant is about \$40,000. The equipment is valued at \$2,500, and the library at \$1,000. The course of study is practically the same as in Dunn county and three regular instructors are employed. The superintendent stated that 50 per cent of the girls usually come from the villages and city. It was estimated that at least 90 per cent of the boys return to the farm. On inquiry we found that the people of the county are not particularly interested in higher education. Very few children from the county are attending high schools or college. The expense of students for room and board here runs from three to four dollars per week. This school has graduated 56 students during its existence and there are thirteen in the graduating

class of the current year. Short courses are conducted the same as in the Dunn county school.

The equipment in these county schools of agriculture consists of a limited amount of apparatus for physics, chemistry and soils, the ordinary equipment for a manual training shop, and cream separators, Babcock tester and other apparatus for work in dairying. There is sufficient equipment for practical elementary instruction in the several agricultural subjects.

The other four county schools of agriculture in Wisconsin have practically the same courses of study and are managed in a similar way. The two mentioned are the oldest and are selected as being typical of what the county school of agriculture could be.

The population of these counties is largely German and Scandinavian. It was found that in these counties a very small percentage of young people from the rural districts attend the public high schools, their education practically being completed in the rural schools so that in almost every case the young people who attend the county school of agriculture would not have attended any school beyond the rural school had it not been for this special opportunity. The average per capita cost per student in these schools ranged about \$130 per year and the number of students attending, as above stated, would come from an average school population of about 8,500 children, so that the number attending these special schools is very small as compared with the school population of the county. However, from the statement just made, that few of these young people would have attended any institution of learning other than the rural school, it would seem that the special county school of agriculture does perform an important function in the educational system of the counties where located as well as in the state.

Menominee County Agricultural School, Menominee, Mich.

This school was established under a special act of the legislature in 1907. The law authorized the board of supervisors to appropriate money for the organization of the county school of agriculture and domestic economy. The issuance of bonds in order to raise the necessary money was made subject to the vote of the electors of the county. The board of control consists of five members, one of whom is the county commissioner of schools. The board has the usual powers given to boards of education and the law makes it possible that two or more counties may unite in establishing such a school. Under the original act the county was required to provide buildings and equipment and maintain the school. This law was amended in 1909 in such a way that the state now provides two-thirds of the expense for its man-

agement and not to exceed four thousand dollars in any year. The city of Menominee donated 107 acres of land to the county and the original appropriation for buildings was \$20,000. The entire population of the county is 38,000 and the school population 9,000, about one-half of which is in the city of Menominee. The entrance requirements are placed at completion of the eighth grade, but are somewhat elastic for older students. Number of boys enrolled during the current year, 18; number of girls, 38. The annual cost of the school is about \$7,500; the present value of the plant is estimated at \$65,000, the apparatus at \$1,000, and the library at \$300. The school has graduated 18 students and 11 completed the course in June, 1910, three of whom were boys. The length of the course is two years of nine months each, and three regular instructors are employed. The school is well equipped for manual training and domestic science work and has a fair equipment for agricultural work. The apparatus for instruction in dairying is particularly good. The institution owns several cows, horses, and other live stock and poultry, and the laboratory work is supplemented by observations on nearby farms. During the current year a short course for farmers was conducted through eight sessions with special lectures. The superintendent estimated that about 500 farmers attended these courses. During the past year a dormitory has been constructed which will accommodate all of the students. The expense per student for room and board is about \$3.50 a week.

The population of Menominee county is largely foreign. There are several graded and high schools but very few children from the rural districts attend them. The county commissioner of schools stated that in his judgment very few of the children who attend the county school would be in school anywhere were it not for this institution. The instruction in the several departments is excellent, the purpose being to train young men and women for actual life on the farm.

GENERAL OBSERVATIONS ON SPECIAL SCHOOLS.

The investigations of the committee and the answers to questionnaires show that it is the purpose of those in charge of these schools to provide elementary training which shall interest young people in agriculture and if possible train them for the vocation of farming. We have shown that in the counties where these special schools are established the rural people are not generally inclined to high schools and to secondary instruction. They seem to be interested only in their vocation and in the business of making a living; as soon as the child is old enough to work, the need for education practically ceases in the eyes of these people. Under these circumstances the special school seems to attract some attention

and evidently does a much needed work. It would seem that both in Wisconsin and Michigan the policy of establishing special secondary schools was inaugurated before any effort was made to introduce vocational courses into the public schools. The figures given above show that about 1 per cent of the pupils of Dunn county and three-tenths of 1 per cent of the pupils of Marathon county attend these schools. In Menominee county, Michigan, the attendance is approximately six-tenths of 1 per cent. The annual expense for each school averages about \$7,500. When we consider the number of school children, the number of high schools and the results so far secured from the special school it is pertinent to consider whether it would not be better educational and business policy to make a strong effort to interest the people more thoroughly in the public schools, and especially in the high schools, and introduce therein special or vocational courses rather than to organize a separate and special educational system for secondary vocational instruction.

PUBLIC HIGH SCHOOL AGRICULTURE.

The typical cases of this class of schools are found in Minnesota and Michigan, and through questionnaires we secured information from the schools at Albert Lea, Canby, Glencoe, Lewiston, and Red Wing, in Minnesota. There are ten high schools giving regular courses in agriculture with special instructors for these subjects. We shall compare the schools in Michigan with those mentioned above in Minnesota. By reference to the tables it will be found that these places in Minnesota range in population from 900 to 12,000. The enrollment in the high schools ranges from 34 to 243. The number of boys fourteen to nineteen enrolled ranges from 18 to 90, and the number of boys taking agriculture ranges from 17 to 39. The course in agriculture pursued in these schools includes botany, farm crops, carpentering, horticulture, poultry, blacksmithing, entomology, and live stock. The reports show that in each case there is a small tract of land for the use of the school and that the agricultural instruction is given at comparatively slight extra cost; but it should be noted that the figures given in the table include as extra cost the purchase price of land, which would become a permanent improvement and ought not to be charged to annual per capita cost.

The instruction in each of the ten schools mentioned above is given by one special instructor in agriculture and in addition to the regular work done in the school a special short course is presented during the winter months for the farmers of the surrounding community. The tables indicate that the attendance at these courses was good. The subjects presented

were such as to reach especially the conditions in each case. It is too early to judge definitely of the effect of this instruction, but if the policy is continued we may safely predict that it will become a strong educational and industrial factor in each community.

The state of Minnesota has taken advanced ground in regard to industrial education. The Putnam Act, passed by their last legislature, provides for the introduction of courses in agriculture, manual training and domestic economy in the high schools of the state, in graded and consolidated schools, and authorizes rural schools in the vicinity of such schools to become associated with the high schools for the purpose of receiving instruction in these special courses. The law provides that the instruction in these courses shall be free to all residents of the state, and that instruction shall be given in all the subjects pertaining to agriculture and domestic economy; also that trained instructors shall be employed and that each school must own a tract of at least five acres of land. The state appropriates an amount equal to two-thirds of the actual expense of this special instruction, but the appropriation cannot exceed \$2,500 per year for any school and not more than ten schools can be established the first year nor more than ten additional in each succeeding year. It is too early to determine the absolute value of this departure in education, but it is the clear purpose of the people of Minnesota to have the so-called practical or vocational subjects within the reach of every child in the state, and it remains for the schools and teachers to present this kind of instruction in such a way that it shall commend itself to the people of the state. From every county in Minnesota where agriculture has been introduced in the high school courses of study we received extremely favorable reports concerning the work—from teachers, students and farmers—thus showing that the work is appreciated, that the attendance is increased, and that its value is discoverable even though the schools have been in operation such a short time.

HIGH SCHOOLS OF MICHIGAN.

During the current year regular courses in agriculture will be given in eleven high schools of Michigan. The subjects included are agricultural botany, farm crops and horticulture, live stock, dairying, soils, poultry, live stock improvement and feeding, farm management and farm mechanics. These subjects are organized as units in each year of the high school course—agricultural botany being given in the ninth grade; farm crops, elementary soils, horticulture and insect life of the farm in the tenth grade; live stock, dairying, and soils in the eleventh grade; live stock improvement and feeding, poultry and farm management in the twelfth grade, the combina-

tion for each grade counting as a single unit and the entire work being elective.

Reference to the courses appended hereto will give a comparison of the character of the courses in the different states. From the Michigan figures it will be noted that the population of the district ranges from 650 to 6,000, thus making the high schools of Michigan compare very favorably with those mentioned above in the state of Minnesota. The enrollment in these high schools ranges from 67 to 280, and the number of non-resident students attending from 26 to 80. The number of boys enrolled in these high schools ranges from 29 to 133 and the extra cost of instruction in agriculture from nothing to \$400 per year.* The amount of land used for experimental purposes is small, in some cases no land at all having been used, but it should be stated in this connection that observation and work on the home farms supplement the work of the school. The tables above referred to give a list of special experiments performed by the students together with items observed on their trips to neighboring farms. A considerable part of the regular equipment for work in botany, physics, and chemistry is utilized for experiments in agriculture. Each school has provided additional special equipment at comparatively small expense for work in soil temperatures, soil testing, seed testing, plant propagation, and dairying. The work in farm machinery and farm mechanics is presented by careful observations and work on the premises of some dealer in agricultural implements, also in blacksmith shops. Special observation and experimental work has been done in almost every case concerning farm crops, especially corn, potatoes, and legumes. Thus it will be seen that laboratory facilities are provided at comparatively small expense. The regular library has been supplemented by the purchase of farm papers and magazines and reference works on the various agricultural subjects. This material is not only for the use of students in school but can be drawn upon by the parents at home if desired. The instruction is given by graduates from the Agricultural College.

In connection with the work in the high school, extension courses are presented during the winter months for the farmers of the surrounding community, the regular instructor in agriculture taking a large part in this work. Lecturers from the Agricultural College are provided, if requested. The tables heretofore mentioned show that the number of lectures averaged seven in each place and that the attendance ranged from fifteen to sixty farmers during the entire course.

*In explanation of the extra expense it is proper to say that in one or two cases the special teacher of agriculture taught the regular sciences in the high school and therefore the expense for instruction was not increased over what it would have been had a regular science teacher been employed, who did not teach agriculture.

This instruction is designed not only to assist the farmer but to interest him in the general work of education and make him a partner with his son in education as well as vocation.

The effects of this work after two years of experience are found to be good. Great interest has been stimulated in the school and in the general welfare of the community. In every case the attendance at the high school has increased, and the high school authorities attribute the increase almost entirely to the introduction of the agricultural courses, the increase in attendance coming largely from the rural districts.

The general plan of agricultural work in the Michigan and Minnesota high schools is to emphasize the four leading phases of agriculture, plant life, animal life, soil fertility and farm management, and in doing this the farms and farming appurtenances of the surrounding community are utilized in connection with laboratory experiments in the schoolroom. The attitude of students and patrons of the schools is thus far extremely favorable. The work of introducing agriculture into the high schools of Michigan was begun in the fall of 1908 with one high school.

It is proper to call attention to the fact that the work done in Michigan by way of introducing agriculture into the public high schools has been accomplished thus far without the stimulus of state aid. The credit is entirely due to the Michigan Agricultural College and its interest in the public schools has been manifested in this way. The college created a department of agricultural education and one of the features of the work of that department is to assist in the introduction of agricultural courses in the public schools.

RURAL SCHOOLS.

In addition to personal inspection, questionnaires were submitted to county commissioners of schools of four typical counties of Michigan—Branch, Ionia, Muskegon and Saginaw—with the request that the commissioner should make personal investigation and report the conditions of his county according to the questionnaire. He was further requested to give statistical information from a typical township in his county. The aim of the questionnaire was to determine the educational and labor conditions of rural districts. Accordingly we secured the school census of boys in rural districts fourteen to nineteen years of age, the enrollment in school of the same ages and the number of boys employed on farms. We desired to secure information, also, as to the number of boys between the ages of fourteen and nineteen who leave the farm permanently each year and go to the city for employment, also the attendance at high school. The county commissioner was also requested to secure practically the same information from a typical township in his county, with

the added information as to the number of boys in the township who intended to remain on the farm and who have had no special instruction in agriculture; also the average wage for farm labor.

Reference to the statistical tables will show that the school population in the above named counties, exclusive of villages and cities, ranges from 765 to 1,956; that the enrollment of boys fourteen to nineteen years in rural schools ranged from 282 in Muskegon county to 489 in Saginaw county, and it should be noted that this number was made up almost entirely of boys from fourteen to sixteen, inclusive. Very few boys over sixteen years of age attend the rural schools. It is reported that the number of boys fourteen to nineteen years of age regularly employed on the farm in the foregoing counties ranged from 103 in Ionia county to 950 in Saginaw county. At the same time it should be noted that the number of boys fourteen to nineteen attending high schools in these counties ranged from 34 in Muskegon county to 277 in Branch county, and that the number of boys preparing for college ranged from 15 in Saginaw county to 100 in Branch county.

The information found in the tables from the typical townships shows that in Guard township of Ionia county there were 48 boys in the rural school census fourteen to nineteen years of age, 33 in Berlin (Ionia county), 46 in White River (Muskegon county), and 50 in Tittabawassee (Saginaw county), and of this number 31 attended rural schools in Guard township, 10 in Berlin, 12 in White River, 10 in Tittabawassee; from the same townships the number of boys fourteen to nineteen attending high school was 7 in Guard, 4 in Berlin, 4 in White River, 5 in Tittabawassee. It will be noted, too, that the number of boys of the same ages who intended to remain on the farm and who have had no special instruction in agriculture was 10 in Guard township, 15 in Berlin, 25 in White River, and 28 in Tittabawassee, and that the wage at farm labor in these townships averaged a little less than twenty dollars per month.

The one-room school has performed a large part of the education of the people in the past, but with the changed conditions in the country and improvements in all forms of industry, and especially in agriculture, such a school has become less and less able to meet the needs of the present generation in preparing it for life's duties. In these schools we find a very small amount of apparatus, small school yards and only one instructor, and it is therefore practically impossible for the rural school to enter upon the field of vocational instruction. The most that it can possibly do is through the introduction of elementary forms of hand work, domestic art, nature study, and the elements of agriculture

to develop a respect for vocation. All these subjects must be taught as incidental because of the absolute necessity of training the children in what may be called the regular or academic subjects, such training being designed to give them the power to gather thought from the printed page and to make such computations as are necessary in the everyday affairs of life. Of these things the rural school should give to each child a very definite possession. If the rural school does its elementary work well it may have served its purpose, but it can not and will not fully meet the needs of the rural population.

From the information given above in regard to the effect of agricultural courses in public high schools, where it has been shown conclusively that the introduction of such courses increases the attendance in the high school, especially of boys fourteen to nineteen years of age, we may conclude that if in all rural townships there were high schools presenting courses in agriculture an opportunity would be afforded to those boys who intend to remain on the farm to receive special agricultural instruction and at the same time a larger number of them would be attending school and securing much needed information. These conclusions convince us of the desirability of establishing township high schools wherever high schools are not already accessible to all rural children. For this reason we have introduced in our recommendations a provision for township schools and high schools.

The vital statistics shown by the government census indicate most conclusively that the daily or monthly wage of a man increases almost directly in proportion to the amount of his educational training and particularly in regard to the amount of technical instruction or training which he may have received. This being true, we may conclude that these same boys in these rural townships, when compelled to earn their living, could, through the special instruction possible in high schools, prepare themselves for a higher present wage and of course a proportionately increased wage through life. Thus, from the money standpoint alone, it can be seen from the figures submitted herewith that special agricultural and industrial instruction is valuable and will promote the welfare of the rural community.

REASONS.

The following reasons may be given for introducing agricultural courses into public high schools:

1. The student body is annually recruited from the rural population.
2. The courses of study are easily modified.
3. Laboratories and equipment need only slight modification.

4. They cannot injure the special schools because they do not give the same class of instruction.

5. Agriculture is a vocational subject for those intending to live on the farm and a cultural subject for all others. Not the subject but its use determines its value.

6. There is a distinct gain in the value of the work done in the other sciences presented in the high school because of opportunity for practical application through agriculture, and thus the training will become a vital part in the mental equipment of each student, and he will be led to inquire and experiment for himself.

7. Students are encouraged to receive this agricultural instruction in their own school, thus saving the expense of living away from home.

8. Agriculture can be taught in the high school without the necessity of duplicating subjects and equipment, as would be necessary in the special school.

9. The results are practical so far as actual farm operations are concerned.

10. It has been shown that this instruction develops the thinking and judging powers of the student as thoroughly as any other subject taught in the school.

11. Agriculture, like other industries, must be taught as a science and as an art in itself and not as related to other subjects or sciences.

12. The presentation of agriculture as a subject of study raises it at once to the same plane as other subjects taught in the school and dignifies both the science and the art.

CONCLUSIONS.

In considering any plan of complete industrial education we must include agriculture. From the investigations already made it appears that there is a two-fold problem in all industrial education: (a) To so teach applied science that we do not weaken its power as a tool for research; (b) to so modify our courses of study that we do not lessen their real school value, or what may be termed their cultural and disciplinary value, and yet at the same time benefit the industrial classes.

The fault in our present system of education is largely in its traditions, not in its ideals. We must cherish high ideals but it is perfectly proper to remove and destroy traditions which have become outgrown. It is claimed by some that the introduction of industrial courses into the public schools will commercialize them. It does not occur to us that this is an argument, because if there is any such danger, and we realize it, the means will be found to avoid such results. Without doubt, mistakes will be made in this new movement, because no uniform definite plans are in opera-

tion and the time which has been given to the test is insufficient to determine absolute results.

Of the types of schools mentioned at the beginning of this discussion, the state or college type has, without question, demonstrated its value and performed its function. It does not appear that we need more agricultural institutions of college grade, but the moment we get away from the college grade we find ourselves on uncertain ground because we have as yet found no absolute definition of secondary agriculture. From the types of schools mentioned it would appear that the college type would rank first and that the special state school would rank second, the congressional district school or attached school third, the county school of agriculture fourth, and public high school agriculture fifth. Yet we find all of these subordinate institutions claiming to give instruction in secondary agriculture and our nomenclature immediately becomes confusing. The results of the investigation show conclusively that the same grade of agriculture is not and can not be taught in the public high school or special county school as can be taught in the special state or congressional district school.

It seems to be clear:

(a) That industrial education should provide for training the boy in manual arts and agriculture and the girl in domestic economy.

(b) That the elementary schools or rural school cannot train for vocations because of their limitations, but that they can give certain instruction which shall result in at least a respect for the several vocations.

(c) Industrial training in its narrow sense is not so important for rural schools because country children still have a chance to learn of certain industries at home and children may be given school credit for industrial tasks performed at home.

(d) Secondary agricultural education is here to stay because economic conditions demand it, and public schools supported by public taxation should serve the public; they can do this best by at least presenting enough of agricultural training so that young people may learn to do things and at the same time discover their own vocational traits or tendencies.

(e) Only a small per cent of our high school graduates enter college, therefore the high school course of study must offer at least two fields or prepare for two fields: (1) higher training; (2) practical life.

(f) The public high schools in the last twenty-five years have made rapid improvement and have come into popular favor. This is shown by the fact that the attendance in that

time has more than quadrupled and that the percentage of boys enrolled in high schools has increased by nearly the same ratio. Therefore the present demand of the people that these high schools shall attach certain subjects must be heard and observed.

(g) Probably the quickest way to secure agricultural instruction of secondary grade is through the establishment of special schools. The foregoing discussion, however, shows that the establishment of such schools will necessitate the duplication of buildings, equipment and instruction to a very large extent and thus ultimately make the expense attending such schools very great, if not beyond the limit of public taxation.

To summarize, therefore, we may say that:

(1) The state colleges of agriculture and mechanic arts are fulfilling their mission.

(2) That special secondary schools of agriculture of the state and county type may serve the public best in certain localities but with a comparatively high per capita cost.

(3) That the secondary agricultural high school of the public type may serve practically all of the people of any county or state with a moderate expenditure for buildings, equipment and instruction.

(4) Secondary courses in agriculture should emphasize four fundamental units: (1) plant life; (2) animal life; (3) soils; (4) business agriculture; and regular courses in these subjects should be made a single unit in each year of the regular high school course.

In Appendix B will be found typical courses of study in special secondary agricultural schools, also in public high schools, which will be interesting by way of comparison.

REPORT OF THE SUB-COMMITTEE ON ELEMENTARY INDUSTRIAL EDUCATION.

S. O. HARTWELL, CHAIRMAN.

Industrial training, in its beginnings and in the realization of its needs, is not so new a subject as we may think. It is as old as the industries themselves. But as new occasions teach new duties, so the readjustments of society bring to words new meanings. The industries, as we now use these words, are essentially modern, at once the realization and the product of those immense forces that are the truisms of modern life though of most recent application, transportation by power, and transported power. These have made possible the factory system, the mechanical development, and the minute subdivision of labor, which make the industries of today an entirely different thing from their parent occupations of a century ago. So industrial education in the more restricted present use of the phrase is a comparatively new topic; elementary industrial education is still younger. We might find in the history of the last century many investigators and some experiments, but popular discussion has been, in this country, a matter of the last decade. Yet it has spread so widely and rapidly that fundamental arguments are well understood.

It is needless now to enlarge upon the need for supplementing the present education of the schools with training that shall increase the practical efficiency of all classes of hand workers. The desirability of such training has long been admitted; that it is necessary in the United States, if our laborers are to maintain a respectable position in the various crafts, has been clearly demonstrated by many disputants. The right, the duty, indeed the privilege of the public to maintain such training as an integral part of its general system of education may still need supporters but has passed the point of requiring argumentative proof. It is the duty of this committee to consider the general question as it relates to Michigan.

INDUSTRIAL CONDITIONS.

Michigan may still rank as an agricultural state and in our belief has possibilities in agriculture far above any yet attained, but it needs only a casual view to show that in its combination of the three great activities—agriculture, manufacturing, and mining—it is in many respects unique among the states. Already its diversified commercial interests have

linked the productive energies of the state with almost all lines of industry, and the chances for growth and progress in many departments of manufacturing are as great as the chances of improvement in the tilling of the soil.

While no longer in the central wheat belt, the state is still a large producer of the staple grains—wheat, corn, and oats. Its fruit is known all over the country and the industry of fruit raising seems just now to be entering on a second period of growth. Michigan potatoes reach the markets of Florida and Cuba, and Michigan beans are largely consumed in Boston. In mining one has but to mention Calumet and Hecla to know something of the great record of the state in the production of copper. The iron mines of the Northern Peninsula, the coal mines of the Saginaw Valley, and the salt wells found at many points of the lake coast from Delray to Manistee exemplify the prominence Michigan has as a producer of minerals. Of silver and gold its rocks seem to contain little, but the store of wealth already realized through its minerals and metals is enormous—and the tale is not yet told.

In manufacturing there is a great range of staple products and a chance for development that is still greater. Michigan is at present manufacturing half of the annual output of automobiles in the United States. Detroit has great stove foundries, great car shops, and ship yards. In spite of the necessity for carrying much of the raw material from distant states, Grand Rapids still holds a leading place in the manufacture of furniture. The Kalamazoo Valley is as noted throughout the west for the paper industry as Holyoke is in the east. Battle Creek sends threshing machines and cereals around the world. All sorts of manufactured wood, from matches and pie plates to buggies and billiard tables, are here produced, and work in metal is growing fast. The central situation of the state, with great markets east and west and great stores of its raw materials to the north and south, increases its chance for productive development. The state is a center for the development of electricity from water power, while its transportation routes and connections, whether by water or rail, furnish unrivaled chance for a mercantile growth far above anything yet attained. The greatest present drawback we share with other industrial states—the lack of a number of skilled artisans sufficient to increase to fuller capacity the present activity of its typical manufacturing centers. Steady growth can be maintained only through systematic training of handicraftsmen. To realize the necessities of Michigan in the general question of industrial education one has only to take the map and pick out for himself the centers of manufacturing already developed and the centers of power waiting for work to do. Then he may study any

one of them and find out that capital is waiting for investment in the skill and character of helpers. This does not mean that we have not at present a high class of labor; it means that this state, like others, has not enough skilled laborers to fill its needs. And at present little is being done to insure the succession of skilled artisans.

CONDITIONS OF INDUSTRIAL EDUCATION.

Some of the grounds for the judgments here briefly stated are shown in the appendix, where the statistics gathered by the committee are given, with a brief report of schools visited. In summary, we may say that, so far as technical education in its higher departments is concerned, the state has been in some respects a pioneer, and technical training under public auspices is already well developed. The Michigan Agricultural College was the first state agricultural college established and its influence is still felt throughout the country. The Michigan Mining School has a national reputation, as have the engineering departments of the University and of the Agricultural College. But practically all the work of these institutions is of college grade. Few or none of their graduates, to use the well-worn metaphor, enter the ranks of industry. They are captains and engineers. When it comes to the training of subalterns and the instruction of privates in the armies of skilled labor the state of Michigan is doing nothing and its local communities little more. Manual training as a part of the school curriculum is well established in the cities of the state but, as has been frequently shown, it does not meet this problem. Well equipped manual training high schools at Muskegon, Saginaw, Ishpeming, Calumet and a few other cities are furnishing some foremen in industrial lines, but they send comparatively few people into the trades. A study of the graduating list of the Kalamazoo High School shows that 26 per cent of the graduates of the last five years have shaped their courses in higher institutions through their interest in manual training, but it shows only forty people out of the list of 343 at present engaged in any line of skilled manual labor other than teaching the manual arts. This may be taken as typical of the other manual training courses. Of trade schools there is just a beginning. Through the interest and generosity of Honorable W. R. Burt, East Saginaw established in 1910 a trade class for boys and there are now thirty-two boys in the first two years of its four-year course. The late Honorable Arthur Hill left a generous bequest for the establishment of a trade school and technical high school in West Saginaw. In a pamphlet published this year Superintendent Philip Huber gives the following recommendations regarding courses to be established as soon as the building is completed:

"The aim of the school is—

1. To prepare youth of both sexes for a definite vocation and for efficient industrial citizenship.

2. To give the boys between the ages of fourteen and sixteen an opportunity to learn the elements of trade, and to increase their earning capacity—a training which they could not hope to acquire if they started to work as unskilled apprentices.

3. To help men and women already engaged in a vocation to better their condition by increasing their technical knowledge and skill."

Ishpeming reports trade classes in carpentry and painting in connection with its manual training school. Muskegon gives a valuable technical training in its high school, but, except in printing, has no well defined trade courses. Evening schools giving some trade subjects have been developed by the public schools in several of the cities in both peninsulas; but these cannot, in the nature of the case, meet the main problem.

The Y. M. C. A. in 1909 reported four centers in the state where instruction in industrial and technical subjects is given under its auspices, viz.: Detroit, Grand Rapids, Jackson and Lansing. At Detroit the Y. M. C. A. has established a day school under the name of the Detroit Technical Institute, which has this year been incorporated as a separate institution. It has six departments besides the summer school and night school. Two of these are the trade school and engineering department, in which a co-operative course has been begun. In November, 1910, there were enrolled in the plumbing class 25; in watchmaking, 14; engraving, 10; gas-engine class, 26; mechanical drawing, 125; architecture, 45; co-operative engineering, 26; classes in pharmacy and commercial work enroll 10 and 26 students respectively. These students range from eighteen to twenty-eight years of age and pay tuition ranging from \$20 to \$100 per term. There are twenty-six boys under eighteen employed during the day who are taking night school work in eighth grade studies.

Probably the most authoritative list of industrial schools yet made is found in Bulletin No. 11 of the National Society for the Promotion of Industrial Education, in which the schools are classified as follows:

1. Intermediate Industrial, Preparatory Trade or Vocational Schools.
2. Trade Schools (Day Courses).
3. Technical Schools (Day Courses).
4. Apprenticeship Schools.
5. Evening Schools, giving (a) Technical and (b) Practical Shop Courses.
6. Part Time Schools.

7. Trade Schools for Colored Races.
8. Correspondence Schools.

Under the first heading twelve schools are described, of which one is in Columbus, Ga.; three are in Massachusetts, and eight in the State of New York. Of public trade schools nine are listed, in six different states (all established since 1905). Twenty-one trade schools on private foundation are described, of which six are in Greater New York, while the remaining fifteen are scattered in nine other states. Of the six public technical schools, four are in Massachusetts, while ten supported by private funds are divided among seven states. In the sixth subdivision three part-time schools are mentioned, two in Massachusetts, one in Cincinnati, Ohio. These are the groups of special interest in this discussion. Of the sixty-one schools included, New York, Massachusetts and Pennsylvania together have thirty-eight, and our neighboring states—Ohio, Indiana, Illinois, Wisconsin—each have one or more. Michigan has none. In fact, the only mention of Michigan is in connection with Y. M. C. A. schools.

Evidently the beginnings we have described have been too recent or too slight to secure attention of the compilers, who also would undoubtedly class four of the excellent schools we have mentioned (at Muskegon, Saginaw, Calumet and Ishpeming) as manual training schools, now carefully differentiated from trade schools and not classified in the lists quoted.

Hence it is fair to say that so far practically nothing has been done in Michigan in elementary trade instruction. By the census figures just published Michigan takes rank among the states as eighth in population. Of these eight states Texas and Michigan are the only ones having no trade-schools. Yet the growth of population in Michigan, as in most of the states, is largely in industrial centers. Leaving these out of consideration, the increase of population in the state in the last decade would be barely 3 per cent. Certainly there is as yet no industrial training commensurable either with the school enrollment or the industrial needs of the state. The chance for immediate progress seems to lie in the co-operation of the state legislative and educational authorities with the communities now ready to attack the problem.

PROGRESS IN OTHER STATES.

Let us consider somewhat carefully what has already been accomplished in other states. The movement along its present lines is distinctly one of the last ten years. In Bulletin No. 12, just issued by the National Society for the Promotion of Industrial Education, Dr. E. C. Elliott reports:

“Of the 29 states legislating with respect to practical activities of any type, 25 have enacted their present provisions since 1900. Of the 11 states providing for industrial and trade training, all have

enacted their present provisions since 1902. The first commission for the study of industrial and technical education, in whose wake more than a half-dozen others have followed, was not appointed until 1905. No other educational movement, calling for large expenditures and involving sweeping changes in curriculum and method, has received such prompt legislative recognition as has the demand for practical and trade training.”*

This rapid progress does not of itself prove the validity of the argument for industrial and secondary technical training, but that argument need not be presented here.† We shall take for granted these contentions: first, that such training is profitable alike to the individual and the state; second, that it is a fundamental part of the broader social education which is gradually enlarging our individualistic conceptions of public school work; and, third, that it is entirely within the province of our present public systems. So the narrower question at present before us is how best to organize an effective state approval and support.

The evident need which has stimulated the recent advance noted by Dr. Elliott is stated tersely in a recent report:

“In New York city approximately 37 per cent of the population are engaged in mechanical and industrial work; 37 per cent in business; 19 per cent in domestic service, and 5 per cent in the learned professions, and undoubtedly other large cities of our country would show similar distribution. There are many schools for the 5 per cent in the learned professions and there should not be fewer; but aside from engineering schools of college grade, there are but few containing thorough practical courses for the 37 per cent engaged in mechanical or industrial work.” (Report of N. E. A. Committee, 1910, p. 100.)

The first state seriously to undertake action was Massachusetts, and the report of the Douglas Commission of 1905 is still one of the most valuable documents on industrial education. The plans undertaken by the second commission organized under the Legislative Act of 1906 (Chapter 505) have been considerably modified, and the commission itself has since been merged in the State Board of Education. But the chief features of the system first started remain. Schools organized under general state supervision and a control partly state and partly local, but independent of the regular local boards of education, receive state aid to the extent of half the expense of maintenance, though the whole cost must first be raised by local taxation in addition to the taxes assessed for or through the usual system of public schools.

* The bulletins of this society will hereafter be referred to as Bulletin Number I, II, etc.

† For a skeptic, or for one wishing to review the main argument, we would suggest the following books and reports as informing and suggestive: Report of Massachusetts Commission, 1906; Beginnings of Industrial Education, Paul Hannus; Education for Efficiency, Eugene Davenport; Report of the Committee on the Place of Industries in Public Education, N. E. A., 1910; The Worker and the State, Arthur D. Dean; Vocational Education, David Snedden.

"All cities and towns may provide independent industrial schools for instruction in the principles of agriculture and the domestic and mechanic arts, but attendance upon such schools of children under fourteen years of age shall not take the place of attendance upon public schools as required by law. In addition to these industrial schools, cities and towns may provide for evening courses for persons already employed in trades, and they may also provide, in the industrial schools and evening schools herein authorized, for the instruction in part-time classes of children between the ages of fourteen and eighteen years who may be employed during the remainder of the day, to the end that instruction in the principles and the practice of the arts may go on altogether." (Mass. Law as quoted in Bulletin No. 12.)

Under this plan notable beginnings have been made in establishing trade schools. The report of the State Board of Education, issued in January, 1910, shows a list of seventeen schools in sixteen Massachusetts cities and towns organized in this way. We should add that there were previously the state textile schools, established by legislative act in the nineties at the cities of Fall River, Lowell and New Bedford. It should also be noted that several communities in which general school sentiment is most progressive have preferred to organize similar work under their local boards of education. At Newton and Springfield the technical high schools, while not distinctly trade schools, are emphasizing the fundamental work of carpentry and the mechanical trades for boys, and of the domestic arts for girls. Springfield has had for several years an effective evening public school of trades, and in 1909 established an elementary industrial class, which now includes about eighty boys. The school authorities of Chicopee go further and maintain that vocational courses should be an integral part of the ordinary high school. They have shop courses in cabinetmaking and machine work, which are taken by all the boys of the first two high school grades. Fitchburg has developed an effective trade course on a special part-time plan, which we shall discuss later.

Connecticut, under laws passed in 1909, has established two state trade schools, at Bridgeport and New Britain. They are under state control and paid for by state funds, though at both places local aid is promised. The cost to the state is not to exceed \$50,000 a year. The "independency" shown in these two states has come partly from local conditions and partly from a feeling that this movement in purpose and content was too foreign to the training and point of view of the "school-men" conducting public education to be fairly administered by them. On the other hand, some of the school-men have combated the

movement, believing it a manufacturers' scheme to secure recruits for factory exploitation. Perhaps it is unwise for any progressive movement to sift too closely its adherents; some are always seeking selfish advantage. But we believe this problem is bigger than any question of manufacturer's profits or of factory labor as a commodity. It is as vital to the state as any other department of public education. Indeed, the problem will not be fully met until the occupations as a part of education are recognized in the content of lower grade instruction. We firmly believe that more can be done through union with the present organization of public education than by separation.* At least Michigan conditions are favorable to a unified organization. Therefore, we shall find more of value in the plans undertaken in New York, Wisconsin, and Ohio, the remaining states which have completed effective state legislation on this subject.

Michigan finds a New York ancestry for many of its people, customs and political units; we may secure valuable hints from the system of industrial training authorized in that state in the laws of 1908 and 1910. It is a method of partial state support and control, or, looking at it from the local point of view, a method of state aid. Local authorities are given the power to establish, conduct and maintain trade and industrial schools. The course of study must be approved by the Commissioner of Education. The schools are of three types:

- a—Those giving general industrial training.
- b—Those giving trade training.
- c—Those giving training in agriculture, mechanical arts and home-making.

The schools are supported by local taxation and are under the direction of the general board of education, which has the appointment also of an advisory committee representing the industries taught. The state repays the school district \$500 annually for the first teacher and \$200 annually for each additional teacher. It will be seen that this method prevents any attempt to exploit the state treasury by starting schools where they are not needed, as the local expense would be too great. In the day schools provision at present is made only for children who have not yet left the public schools. For the elementary industrial schools pupils must be fourteen years of age or grammar school graduates. For entrance into the trade schools pupils must be sixteen years of age. The State of New York has a carefully organized state department of education, and the supervisory work of that department means more than in some of the other states. It is interesting to note that both in Massachusetts and New York one assistant com-

*In fact the division of local control prior to the age of specialization seems to us to come from a false theory of education.

missioner (under that or some other title) has direct charge of the supervision and development of these industrial schools throughout the state.

In point of legal sanction, Wisconsin and Ohio have gone further than Michigan, though agricultural schools have made as much progress here as in Wisconsin. On the trade side little seems to have been done in either state. Milwaukee has a fine trade school, with excellent equipment and an unusually strong teaching force; but its cost, considering the numbers reached, would make its plan prohibitive in any but large cities. Wisconsin also has a most valuable institution in the Stout School in Menomonie; while in Ohio, Cleveland has developed a fine technical high school. But neither of these seems more typical than the schools at Muskegon and Saginaw, which have been developed through the co-operation of philanthropists with local educational authorities.

It will be seen, therefore, that so far as we may use the experience of others, the commission believes a modification of the New York plan better adapted to Michigan conditions than any of the other systems yet devised.

ORGANIZATION NEEDED.

Any successful plan must be founded upon sound theory. When we come to consider the general question two points of view, in the way of school demands, are at once evident.

I. Through the separate occupations there is the demand of society for efficient workers. Steadily the work of the world is being classified and the classes subdivided until the puzzle seems frequently to be how to secure proper efficiency without making too rigid a stratification of social groups. If we may suggest a personal view—we believe that the solution of this problem must be found in dignifying efficiency, whether manual or mental, and that here arises one of the greatest responsibilities of the public schools. The work of the world must be done; to be done it must be classified and apportioned, and to be done satisfactorily we must secure for each kind of work trained and willing workers. Training for work means education, at least it means a part of education which few at present are getting; and willing workers in certain callings will not, in large numbers, appear until through education we shall have established a sentiment that efficient labor dignifies itself. It is not the province of the public school to direct into one or a few of the channels of human action all of its best product. The schools have not meant to do this, but their inherited traditions, their organization and present courses make this hard to avoid. The complete solution will come only, to quote a recent writer, when "It will be possible for anyone to receive instruction in any subject at any time. Nothing less can be acceptable in an American democracy."

Our skilled trades are essential to our civilization and prog-

ress. If they are to hold their proper place and improve their own conditions, they have a right to their share of well-trained recruits. Upon some schools, then, public or private, there lies the just claim that workers in the trades shall have equipment similar in the points of maturity, training and intelligence to the equipment of those whom we attempt to fit for the so-called intellectual pursuits. We cannot escape the conviction that in all of our states, and certainly in Michigan, where public education has from the first been carefully planned and provided, the responsibility lies largest on the public schools.

The age at which special training should begin is the first important point. If the skilled manual occupations are to get their share of intelligence, no plan of industrial training which brings the individual choice below sixteen or shoves into these occupations pupils of irregular or slipshod mental habits will be fully satisfactory. For secondary trade schools sixteen years should be the lowest limit of age at which applicants will be admitted. A lower limit would meet at the outset two practical difficulties; one, the antagonism of employers, for they recognize the need of maturity in their recruits, and are fast coming to appreciate the economic cost of immature laborers. On the other hand, artisans themselves would be opposed, since their constant sentiment is to prevent exploitation of their children. If the remainder of the demand is to be met, viz., training and intelligence equivalent to that secured by candidates for the professions and for business life, we must have intensive trade courses whose content and method must be largely under the direction of the trades involved. Instruction should be given by practical mechanics with attendant shop practice, co-operative, or otherwise. In our judgment such schools should be established under state plans and by state aid and connected through their official boards with the public schools on one side and the trades on the other. The New York plan gives suggestions as to this possibility.

II. But the second point of view is just as imperative when we look at the present conditions of elementary education.

At present there lies upon us the necessity better to adapt to productive citizenship those children who, either through carelessness or lack of means, drop out of school at fourteen, or even earlier. Once started among the unclassified, they find it almost impossible to secure, even as adults, a foothold in the skilled and gainful occupations. Of course, someone must do this drudgery; still the whole tendency of civilization is to reduce the ratio of unclassified to skilled labor. "Some parts of the domain of unreflective labor will long be left untouched, but the process is going forward. It is clear that, while education is rendering the toilers dissatisfied with the

humblest sorts of occupations, science is steadily sweeping away these occupations." (The Worker and the State, p. 163.)

If we are to maintain public education in its widest sense, we must plan to prepare for effective service those who now are wholly unprepared. Thus we shall find in Michigan at present, as elsewhere, the need of a kind of industrial schools, possibly temporary, but just now most practical. We may name them elementary industrial schools, or vocational schools, as distinguished from the secondary trade schools just mentioned. Their main intent would be to save for reasonable efficiency pupils who otherwise would drop out of school to become units of inefficiency. These schools should take pupils at fourteen or older and give them the rudiments of one or more of the fundamental occupations and some knowledge of the wider problems of the industries. They should not be asked to impart much technical skill, nor should they be considered as trade feeders.

In our opinion there are many localities in Michigan in which both kinds of schools just mentioned could be quickly and effectively organized. In some the first kind could best be started, in most the second. For the second, well established with two or three courses, would straight-way be found furnishing material for the more extensive work of the trade school. A suggestion of the material at hand to be benefited by such schools is found in the following record of school permits issued in Kalamazoo during the school year of 1909-1910 and the first two months of 1910-1911. During the first period 162 applications were filed, falling into three classes:

First. Issued because applicant had completed Grade VIII in school.

Second. Denied.

Third. Issued for cause.

The latter class is shown in the tables.

KALAMAZOO PUBLIC SCHOOLS.

Permits given September 1, 1909-June 1, 1910.

	Boys.	Girls.	Total.	Poor Health.	Necessity.	Lack of School Interest or Progress.
Age 14....	12	15	27	3	24	
Age 15....	48	36	84	1	73	10
	—	—	—	—	—	—
Totals ..	60	51	111	4	97	10—111

Permits given September 1, 1910-November 8, 1910.

	Boys.	Girls.	Total.	Poor Health.	Necessity.	Lack of School Interest or Progress.
Age 14....	5	3	8	1	7	
Age 15....	19	14	33		31	2
	—	—	—	—	—	—
Totals ..	24	17	41	1	38	2—41

We have, then in an industrial city of favorable school conditions 111 pupils stopping school in one school year, of whom the large majority might have been induced to stay had a part-time school given them a chance for self-support, or a vocational school made clear to them the economy of perseverance. Necessity is in these cases a flexible plea, and the prolific "mother of invention"; yet, after all reasonable discounting, that and lack of progress bar the road of school advancement, indeed of life-opportunity, for too large a percentage of the children of the state. Later charity and philanthropy cannot overcome the loss thus imposed on society. Moreover, in this state these schools can easily be adjusted to our present public school system. This committee has received returns from forty-seven cities and towns in the state in which manual training is already underway; about a dozen have well-developed high school courses and two or three have special ungraded schools, as, for instance, Detroit, Grand Rapids and Kalamazoo, in which manual work is already emphasized, though not organized on the trade basis.

Successful experiments in this field have been started in several cities. Cincinnati, Ohio, and Fitchburg, Mass., have developed part-time systems easily adapted to large or small localities, in which certain industries are concentrated. Rochester, N. Y., and Saginaw, Mich., illustrate practical ways of developing trade schools. At Cincinnati a public school instructor is in charge of various groups, some two hundred boys in all, who are employed as apprentices by different manufacturers; their apprenticeship is guarded to prevent exploitation, and to secure practice in different kinds of shop work. These boys work in the shop five and one-half days and go to school one-half day at the same rate of pay. The instructor is peculiarly fitted for the work, and those who have inspected the schools declare that the results secured are remarkable.

Fitchburg, Mass., a "machinery town," has a plan of half-time work that has two distinct advantages; it gives a boy the chance for a good amount of instruction in the theory, methods and drawing needed for a special trade, and secures for him practical shop work, under shop conditions, with up-to-date machinery. The school also avoids the necessity for a costly mechanical equipment that would rapidly depreciate. The boys are directed in their shop work to some extent by the instructor and are assigned in practice to the different shops in co-operation. Boy A spends this week in the shop, while boy B is in the school; on Saturday morning boy B goes to the shop to find what work A is doing and where to take hold on Monday morning. The second week boy A is in school and boy B in the shop, and this alternation continues through the school year of forty weeks, so that each boy secures twenty

weeks of instruction and twenty weeks of practice. The boys who persevere through the year have a chance to work during the summer. The two shop years are preceded by one entire year of academic work. The boys are paid a certain definite wage per hour for work in the shop years and have an outlet into the shop at the end of their course.

The Rochester Factory School, Rochester, N. Y., was established in 1908. Its aim is to keep boys in school longer than they would otherwise stay and give them instruction preparatory to industrial life. The school is under the Board of Education of the city of Rochester and the State Education Department, and is supported by municipal funds and state appropriations under the law of 1908. For purposes of instruction an old school building is utilized, the equipment of which is valued as follows:

Cabinet Making Department.....	\$2,200.00
Electrical Department.....	700.00
Carpentry Department.....	200.00
Plumbing Department.....	300.00

The budget for 1909-10 was \$13,375.

The completion of the sixth grade and an age qualification of fourteen years are required for admission. The age requirement is waived in case of younger children of advanced standing.

The class work includes mathematics, drawing, English and industrial history from the trade point of view and takes one-half of a six-hour day; the other half is given to shop work. One hundred and four pupils were enrolled in 1909-10. While the total cost for the year was \$16,000, furniture made and repair work done for the Board of Education was credited back, at fair rates, to the amount of \$10,000. Hence the net cost was in round numbers \$6,000. Factory procedure is followed so far as possible; for instance, if bookcases are needed, at least six of one pattern are made at one time.

The establishment of the Saginaw Trade School is described by Supt. E. C. Warriner in a circular sent out last year:

SAGINAW TRADE SCHOOL.

Establishment. October 30, 1909, the Hon. W. R. Burt addressed a letter to the superintendent of schools, saying that he would furnish the sum of \$2,000 to pay the expense of a trade school for the present school year. This letter was turned over to the Board of Education and a special committee of the board was called for November 3. At this meeting a petition was presented to the Board of Education, signed by fifty-six machinists of the city, protesting against the establishment of a trade school on the ground that it would put "on the market a lot of

inexperienced men and be a detriment to the trade." The matter was thereupon referred to a special committee of the Board of Education. This committee met representatives of the machinists of the city November 5, and a long discussion ensued on the subject of trade schools. Meanwhile the feeling grew that the matter ought to be put before the people of the city, and, accordingly, at a special meeting of the Board of Education, held November 10, it was decided to call a public mass meeting at the Auditorium Sunday afternoon, November 14. This meeting was addressed by different persons, and, after a general discussion, it was voted to recommend to the Board of Education the acceptance of Mr. Burt's gift, and the establishment of the trade school. At the regular meeting of the Board of Education held November 17, 1909, this action was accordingly taken. The trade school was opened January 5, 1910, using the lunch room in the high school building as a session room for the school.

Admission. Announcement was made through the schools and in the daily papers that the trade school was to be opened and any boy over fourteen years old who desired to learn a trade was invited to send in his application. In all eighty-nine names were received. The superintendent visited the schools and talked with the boys in regard to their wishes. It was found that some of the boys had no definite idea as to any trade to be learned, while others were fully decided. As by far the largest number wished to learn the machinist's trade, this was selected as the trade to be taught. Next the parents of the applicants were asked to call at the superintendent's office and express their desires in the matter. There was now a falling off in the number of applicants, but forty-five appeared with their parents. As it had been planned to begin with one class, it became necessary to refuse admission to some of the applicants. The final decision was to take only those boys who were over fifteen years of age. Of those there were twenty-eight, so that the school opened with this number belonging.

Aim. The aim of the school as at present organized is to teach the machinist's trade.

Course of Study. The course of study laid out is three years in length.

III. Completely to meet present needs there should be legal sanction and state assistance for a third type of school. The so-called Continuation School, which is already adopted in the state plans of Massachusetts and Connecticut, is practically in operation under the title of Evening School in cer-

tain centers in the various states already mentioned. Twenty-seven are separately listed under Evening Schools in Bulletin No. 11. While at present the work is almost entirely the providing of evening classes, into which ambitious workers enter, the tendency is toward finding some method like the Cincinnati plan, above described, for securing the co-operation of manufacturers in sending to these schools present workers who are only half trained. The pupils fall into two groups—first, adults who have already gained their trade with slight training; second, those who can secure only an elementary industrial training before it is necessary for them to become wage earners. For the first class of workers, the courses given for many years by Mechanics' Institute, at Rochester, N. Y., present a valuable type. For the second class, the Rochester Factory School, already mentioned, furnishes excellent suggestions.

STATE CO-OPERATION NEEDED.

There are two great reasons why the state should assist in developing plans for public industrial education within its boundaries, not simply by permissive legislation, but also through financial aid to given localities. The first is a simple plea of justice. We have tried to show the reasons for the demands of industrial education. The state assumes regulative control of other departments of public education, and to them it gives through the various college and school funds financial assistance. If it assumes regulative control as well in this department (and from this there would seem to be no escape), it should take also a part of the financial responsibility for the new line of public education.

The second great reason is that the problem is too big for the separate localities: (a) Because of the great diversification of industries and the migratory tendency of labor under our present shop and transportation systems no locality can possibly undertake all that would be desirable, and, furthermore, each place would find itself training workers for other places, quite as much as for itself. This is reciprocal and within certain limits worth while; but as we search the facts we shall find that the state in practically every instance is the gainer. Probably the state is the smallest of our political units that can undertake the plan of organization, though the local units must be left quite free to determine their special lines of co-operation.

(b) We must face large expense. A state wide plan with state supervision and aid would naturally involve concentration for certain trades in a few places most favorable and thus bring a diversification of training throughout the state with a concentration of effort in special localities. For local initiative

would evidently mean much duplication of effort and scattering of energy.

(c) On the theoretical side, the state is most interested in its own citizenship. Herein lies the basis of our present educational system, and to the state we should look for the sanction under which we may organize this new form of education and for the aid through which different localities may undertake it.

(d) If we look for examples, we see that the problem has already been undertaken by other states whose industrial development may be a little in advance of Michigan conditions, but whose industrial prospects are no greater than our own. If the next ten years show in Massachusetts, New York, Ohio and Wisconsin as great a progress in this department as has the last decade, the changed conditions will mean to them a great advantage in competition. Michigan laborers must meet this competition; her manufacturers must meet the conditions of labor that this training will produce. The state, rather than the special locality, has thus the greatest interest in this movement.

CONCLUSIONS AND RECOMMENDATIONS.

We have discussed the reasons for the recommendations already given in the report of the commission. For convenience we repeat these recommendations so far as they refer to industrial training:

First—That to cities of 5,000 or more in population that shall establish (a) an elementary industrial school, or (b) a trade school for boys over sixteen years of age, or (c) a trade school for girls over sixteen years of age, there shall be allowed by appropriation from the state treasury the sum of \$500 for one instructor employed and the sum of \$250 for each other instructor employed up to a limit of four instructors in all.

Second—That cities having a population of 20,000 or more shall be authorized to establish evening or continuation schools of trades, and that to such schools there shall be allowed from state funds a grant of \$500 toward the salary of the first instructor and \$250 for other instructors, provided the total grant to any city under this recommendation shall not exceed \$1,000.

Third—This state aid shall be in the form of reimbursement for money raised by taxation in the given locality and spent for the purpose indicated, and shall be paid only upon the presentation of properly accredited vouchers.

Fourth—The amount thus appropriated by the state for the industrial and agricultural training shall not exceed for the first year a total of \$30,000, for the second year a total of \$40,000, or for any subsequent year a total of \$100,000. Schools

shall be accredited or rejected by the State Board of Education, according to statutory provisions.

Fifth—The supervision of courses, accrediting of schools, and proper certification of teachers for industrial or agricultural schools should be placed in charge of the State Department of Education.

Seventh—That the appointment of a second Deputy Superintendent of Public Instruction be authorized, who shall have general charge of this branch of education.

RECAPITULATION.

We have considered industrial education as connected with the needs of Michigan rather than abstractly. For themselves elementary and secondary industrial training may be urged on the following grounds:

I. 1. "Industry, as a controlling factor in social progress, has for education a fundamental and permanent significance.

2. Educational standards, applicable in an age of handicraft, presumably need radical change in the present day of complex and highly specialized industrial development.

3. The social aim of education and the psychological needs of childhood alike require that industrial (manual-constructive) activities form an important part of school occupations.

(a) In intermediate schools industrial occupations are an important element in the wide range of experience necessary for the proper testing of children's aptitudes as a basis for subsequent choice of specific pursuits, either in vocations or in higher schools.

(b) In secondary schools industrial occupations properly furnish the central and dominant factor in the education of those pupils who make final choice of an industrial vocation. Vocational purpose is the distinguishing mark of the 'technical' high school as distinct from the 'manual training' high school."

—Report of N. E. A. Committee, p. 6.

II. Put more concretely, there is need to secure, by means of specialized education, a more rational choice of vocation by individuals and better individual training, for two reasons:

1. The demand of society, through the industries, for more efficient workers.

2. The demand that society, for its own sake, recognize the need for differentiation in training in order to prevent social waste.

III. There are several ways of meeting the problem:

1. By a readjustment of elementary education which

shall more fully recognize industry as a social factor; but this is a matter of internal growth rather than external adjustment through legislation.

2. By means of special departments in our school system, of which the following are immediately valuable and deserve state sanction and state aid:

(a) Elementary industrial or vocational schools for pupils from fourteen to seventeen years of age.

(b) Secondary industrial or trade schools taking boys and girls at sixteen years of age and training them first, in general intelligence; second, for skill in a specific trade.

(c) Continuation schools for workers who wish to secure further training.

IV. Michigan should authorize and aid these forms of industrial training:

1. From the broad ground of interest in securing the best citizenship.

2. Because of its unique position and great possibilities industrially.

Suggestive material in regard to special schools and courses of study will be found in the Appendix.

THE PRESENT CONDITION OF INDUSTRIAL EDUCATION IN GERMANY.

E. C. WARRINER.

The industrial schools of Germany may be divided into four classes, as follows: 1, Technical High Schools; 2, Intermediate Technical Schools; 3, Lower Industrial Schools; 4, Industrial Improvement or Continuation Schools. These terms need explanation, which will be given in the following discussion:

1. The term high school, as used in Germany, refers not to a school of secondary grade, as in this country, but to an institution of college or university rank. The German technical high school then is a high grade engineering school, like the Massachusetts Institute of Technology or the engineering department of the University of Michigan. There are nine technical high schools in the German Empire, at Aachen, Berlin, Brunswick, Darmstadt, Dresden, Hanover, Karlsruhe, Munich and Stuttgart, with a total attendance of 16,826 students. In general, admission to these technical high schools requires the completion of a nine-year course in a secondary school; that is, in a Realgymnasium or in a Higher Realschule. As pupils enter the secondary schools at the age of nine, they are eighteen when ready to enter the technical high school. There is at present, however, a tendency to admit students at a younger age, and in certain cases most of the technical high schools will take students who have completed but seven of the nine years of the secondary course. The technical schools have four departments, namely, for the training of architects, civil engineers, mechanical engineers and electrical engineers. They are all fully equipped with laboratories and the instruction is divided about equally between lectures and laboratory exercises. The high school course is four years in length, and upon its successful completion the title of Certified Engineer is bestowed. The technical high schools have also gained the right, through the favor of Emperor William, of granting the degree Doctor of Engineering. This was the most important step ever taken in the development of these institutions, and put them at once on a level with the German universities. Indeed, the question has been much discussed in Germany of incorporating the technical high schools with the universities, much as departments of engineering are organized in American state universities, but the step has not yet been taken. The technical high schools draw their support from fees of students and from taxes in the state in which they are located.

2. The second class of German industrial schools, referred to above as intermediate technical schools, includes a large number and variety of institutions in all parts of the German Empire. Their aim is to train foremen and superintendents for the industries as well as the higher class of skilled workmen. Their admission requirements are not so high and their courses of study are not so long as those of the technical high schools. They require ordinarily the completion of six years of the nine years' course of the secondary school, although certain institutions call for only a good elementary education. In all cases, however, practical shop experience is a prerequisite to admission to these technical institutions. The course of study varies in length from two to four years, but for the most part it is two years long. These schools include building trade schools, schools for the machine industry, textile schools, pottery and industrial art schools, mining academies, forestry academies, schools of navigation, besides special schools, such as the Royal Academy for the Bookmaking Industry at Leipzig.

Specialization of instruction, according to the industrial needs of the community, which is carried to such a high degree in the lower industrial schools, makes its appearance in these intermediate technical schools. Typical examples of these schools are the institutions of the twin cities of Barmen-Elberfeld. These two cities are situated in the heart of the Rhenish-Prussian iron and coal region, not far from Essen, seat of the Krupp Iron and Steel Works. Barmen and Elberfeld join their limits so that it is impossible for the traveler to determine where one ends and the other begins. They have had a remarkable growth since the founding of the empire in 1871, and have today a combined population of over 300,000. Their streets and public buildings are sources of pride to the busy inhabitants. The industries of the cities are naturally similar and have to do especially with the textile and dye trades. More ribbons are made in Barmen, it is said, than in any other city in the world. In ribbons, cord and lace, Barmen rules the world's market. In Elberfeld, the textile industry is specially devoted to the making of upholstering materials and cotton goods, while it has probably the largest dye and color establishment in Germany.

In these two cities, with their 300,000 inhabitants, besides the regular elementary and secondary schools, and also besides the industrial continuation schools, to be described below, are the following industrial schools of an intermediate character: (a) Prussian higher trade school for the textile industry in Barmen; (b) artisans' and industrial art school in Barmen; (c) royal school for the building trades in Barmen and Elberfeld; (d) royal united school for the machine industry in Elberfeld and Barmen; (e) city artisans' and industrial art school in

Elberfeld. The total attendance at these five schools in 1905-6 was 2,394 adult workmen. Some of these men had finished their apprenticeship and came voluntarily to these classes, evenings and Sundays, to improve their condition, while others were day students, preparing themselves for positions as foremen and superintendents in their chosen callings. The distinctive features of the five schools named above are in brief as follows: Since Barmen is a very important center for the textile industry, the Kingdom of Prussia has established here a school for educating leaders in this business, school (a). The large building, given over to the school, is filled with the best weaving machinery the world affords, while its museum has specimens of silk, cotton, plush and upholstering materials in endless variety. The course of study is one year long and includes study of patterns, instruction in materials and spinning, instruction in dyeing and finishing, drawing and stenciling, arithmetic and bookkeeping. Schools (b) and (c), artisans' and industrial art schools, are similar to those found in all the larger German cities. These schools ought, perhaps, to be classified with the third division as lower industrial schools rather than among the intermediate technical schools, since they are not of so high grade as the textile school or the building trades school. The industrial art school offers day instruction for four groups of workmen, viz., decorative, painters, lithographers, cabinetmakers and clay modelers. The artisans' department of these schools gives instruction from eight to ten in the evening and on Sundays from nine to twelve in the morning. The aim of this instruction is to give both apprentices and journeymen the opportunity to increase their skill in drawing and their theoretical knowledge for the following trades: painters, lithographers, printers, cabinetmakers, draftsmen, tinsmiths, locksmiths, wood-carvers, gardeners, shoemakers and tailors. The building trades school (c) has a two years' course for foremen and contractors in the masons' and carpenters' trades. The subjects of instruction in this school are drawing and mathematics in large amounts, together with a study of buildings and building materials. This school as well as the machine trade school (d) is for the combined cities. The last named school performs for the iron-using industries the same service as the building trades school does for the building industries. The course is two years' long and the instruction occupies the entire time of the students.

3. The third type of German industrial schools, designated as lower industrial schools, differ from the intermediate technical schools in that they do not occupy the entire time of the student. They are attended by journeymen, already engaged in their calling, who are ambitious to learn more, with a view to improving both their earning capacity and their joy and

satisfaction in their work. At no point in Germany's industrial life does the difference between the German and the American workman emerge more plainly than in the attendance at these schools. The American workman, when once he secures a position, or a job, as he calls it, is inclined to settle down in satisfaction, with little attempt to better his position, except in the matter of wages. The thought that added knowledge to be secured through study in an industrial school in addition to added skill to be acquired in the factory, the thought that this added knowledge and skill should be prerequisites to better wages has not as yet deeply touched the American workingman. It is true that there are signs of an awakening in this respect, as is shown by the establishment of evening schools quite generally throughout the larger cities of our country.

The future development of American industries and the future wages of our workingmen are bound to be intimately connected with industrial education. In all professional and commercial pursuits it is profoundly true that advancement depends upon knowledge and skill and it cannot be otherwise in the industrial world. This alone will not solve the wage problem. Organization and collective bargaining will still be necessary, but employers will meet their employees in much better spirit, when the latter show such an intelligent interest in their own progress as to strive to better their condition by improving their ability as workmen.

The German workman has been acting on this principle for many years, in increasing numbers and with increasing seriousness in later times. The first schools for workingmen were established over a hundred years ago. They were, for the most part, drawing schools, and met on Sundays, so as not to interfere with the workman's time. In Hamburg, in 1767, an architectural school was founded, and industrial schools sprang up thereafter in many places, in Bohemia, in Hungary, in Austria, in Prussia and in Wuerttemberg. Drawing continues to be the core of all industrial training in Germany, which accounts for the artistic finish of her architecture and of her manufactures. Not an industrial school but what has its studios, its casts, its models in rich profusion. The tendency is away from Sunday classes and in the direction of evening or day instruction in this class of schools. Workmen are grouped according to their occupation, and the number of the groups formed and the variety of trades represented in these schools is positively bewildering to an American unaccustomed to schools for workingmen. In the city of Berlin, for example, there were in 1905-6 one hundred and sixty-three different occupations represented in these lower industrial part-time schools. The workmen meet two evenings a week, two or three hours an evening, for the study of drawing and

designing, business or trade arithmetic and the mechanism of the particular trade in which the journeyman is employed. Instruction in these schools is always adapted specially for the particular group or trade represented by the class, as barbers, bakers, coopers, bookbinders, glaziers, tinsmiths, harness-makers, machinists, etc.

4. The fourth class of German industrial schools, the most elementary type, the most distinctive, and that which we have heard most of in the United States, is the continuation school. As the name implies, the continuation school is a school designed to continue or carry on the education of the boy after he has passed beyond his compulsory age limit, fourteen years. Continuation schools are of three varieties—industrial, commercial and agricultural. The industrial continuation schools, or, as they have been sometimes called, industrial improvement schools, are for boys over fourteen who have gone to work in shops and factories to learn trades, having finished the elementary course in the common schools. Commercial continuation schools are for similar pupils who have entered stores and offices, and agricultural continuation schools for those who live in the country and will become farmers. In some of the German states attendance at the continuation schools is obligatory, in others voluntary. The reason for this is that educational laws are enacted in Germany as in the United States, not by the empire but by the individual states. The German Empire has, however, in its industrial statute, provided that all employers must grant their apprentices the necessary time to attend the continuation school in their locality. Failure to do this is punishable by fine or imprisonment. This imperial industrial statute also makes it lawful for the city or locality to require the attendance of its young men, also women under eighteen, upon the continuation schools. The German Empire consists of twenty-six distinct units—four kingdoms, six grand duchies, five duchies, seven principalities, three free cities, and one imperial land. In every one of these states continuation schools exist. In certain states every community is obliged to set up such schools, and youths from fourteen to eighteen years old are obliged to attend them. In other states continuation school are established by the cities or local communities, with compulsory attendance, and in other cases attendance is voluntary. In the kingdoms of Wuerttemberg and Saxony, in the duchies of Saxe-Meiningen and Saxe-Coburg-Gotha, in the principality of Schwarzburg-Sondershausen, and in the free cities of Bremen and Luebeck, continuation schools are required of every community by state law and attendance is obligatory. In the other states, the establishment of such schools is left to the communities. It must be said that the tendency is more and more in the direction of compulsory schools and of compulsory attendance, and undoubtedly

within the next ten years every German state will require attendance upon these schools. The state law in the Kingdom of Wuerttemberg, passed July 22, 1906, is typical of the best thought in regard to continuation schools. The language of the law in its most essential parts is as follows: "Every community, in which for three successive years there are employed in industrial and commercial pursuits an average of at least forty male workmen, under 18 years of age, is obliged to establish a continuation school, industrial or commercial." * * * "All male workmen under 18, engaged in industrial and commercial pursuits, are obliged to attend the continuation school for three years." One important feature of the Wuerttemberg law is that the instruction must be given in the day time, that is, before 7 p. m. This confirms by statute the observation of all who have ever had to do with evening schools that evening instruction is only a makeshift at best. Those who have worked through the day are too exhausted in both body and mind to obtain the best results from evening study. Employers are required by this law to inform the principal of the industrial school as to every worker under eighteen who enters or leaves their employ within four days of such time. Employers are required to release the workers in order to allow them to attend the industrial school, and both employers and parents must see that the attendance of workmen at the industrial school is punctual and regular, under penalty of fine or imprisonment. The number of hours of instruction required by the Wuerttemberg law is at least 280 a year. The rule is to spread this over ten months or forty weeks, an average of seven hours a week. The principal subjects of instruction in the industrial continuation schools are drawing, arithmetic and German, each adapted to meet the needs of the workman. Cabinet-makers, for example, are grouped in classes by themselves and the drawing which they do relates to this trade. The arithmetic, too, will include the reckoning of the cabinet-maker's stock and of the management of his business, while the German will be reading technical literature, descriptive of this industry. For the most part, the actual practice of the trade takes place in the factory or workshop. The instruction in the continuation school is supplementary to the factory practice and may be called theoretical. The industrial continuation schools of Germany are not in general equipped with machinery or tools except for purposes of drawing or sketching. The tendency, however, is toward furnishing more shop equipment for the schools. This is the case in the larger cities of the Kingdom of Wuerttemberg, and it is true particularly of the continuation schools of the city of Munich, in the Kingdom of Bavaria, where the continuation and industrial school idea has been more thoroughly developed than in any other city of the world.

In 1909 there were in the Kingdom of Wuerttemberg 251 lower industrial and commercial schools, with an enrollment of 28,546 students. This in a kingdom with a population of 2,300,330, comparable in area and population to the state of New Jersey. The great gulf between German and American industrial schools is here apparent. New Jersey has absolutely nothing to offset this number of lower industrial schools. She has a few institutions, which may be classed as higher industrial schools, such as Stevens Institute, at Hoboken, and the Newark Technical School, but of the lower type, or continuation school, the state is absolutely wanting. The Wuerttemberg law provides that each school may charge a small tuition fee to its students, which varies from \$1.00 to \$10.00 a year. These fees, of course, do not pay the expenses of the school, and the deficit is met half by local taxation and half by state contributions. The amount of state aid granted to the continuation schools of the Kingdom of Wuerttemberg in the year 1909 amounted to \$93,732.50.

While Germany is thought of today as an industrial country, this has been true only since 1870. Before that, Germany was essentially an agricultural land, and the same careful attention has been given to agricultural education as to industrial. Agricultural schools of varied form have existed for many years. In each of the twenty-six German states are to be found at the present time one or more forms of these schools, except in four of the smaller states and in the city of Hamburg. The different types of institution are as follows: (a) agricultural high school, an advanced school for the most thorough investigations in all agricultural matters; (b) agricultural schools of an intermediate type, with all-day courses of one or two years in length; (c) agricultural winter schools, short courses, from the beginning of November to the last of March, corresponding to the continuation schools for industry and commerce, described above; (d) special schools, as wine cultivation, fruit raising, bee culture, and veterinary schools. A catalogue of the agricultural schools in Wuerttemberg is as follows:

1 Agricultural High School.....	145	Students
3 Agricultural Schools.....	36	"
8 Agricultural Winter Schools.....	418	"
1 Winemakers' School.....	21	"
1 Veterinary High School.....	132	"
14	752	Students

These agricultural schools are supported in the same way as the industrial schools—by local taxation, supplemented by state grants.

It seems strange at first blush to quote so freely the experience of a country so different from the United States as is

Germany, and to hold its scheme of industrial education up as a model to us. But investigation convinces the most indifferent that we can learn abundantly from Germany. The material progress which the German Empire has made since the Franco-Prussian war of 1870-71 is one of the wonders of the world. When King William of Prussia was hailed as William I, Emperor of Germany, in the palace at Versailles, January 18, 1871, he found Germany an agricultural nation, with industries few and scattered. In the forty years since then, however, she has forged to the front by leaps and bounds, until today she is the foremost competitor of Great Britain and the United States for the markets of the world. Her population has grown from 40,000,000 in 1870 to 60,000,000 in 1905. Her production of coal has increased over fourfold, from .79 tons per capita in 1871 to 3.3 tons per capita in 1907, while that of iron ore has increased eight times, from .04 tons per capita in 1871 to .33 tons in 1906. German manufactures today are of endless variety and of the highest quality. In every German city the factory smokestack pierces the sky and the buzz of the electric motor is to be heard in every German village. The legend "Made in Germany" brought consternation to English manufacturers a dozen years ago. The explanation of this great advance in so short a time is found largely in Germany's system of industrial education. Every student of the subject confesses that no other cause of growth has been so mighty as the industrial schools of the empire. Nowhere else in the world is the intelligence of the average workman so high as in Germany. Engineering skill equal to the German's may be found in other countries. The engineering schools of the United States do not suffer in comparison with those of Germany, but as regards the skill and knowledge of the mechanic and factory operative, Germany leads the world.

It has been a matter of common remark in the United States for ten or fifteen years that all our best workmen are foreigners, mostly Germans. We are now awaking to the necessity of training a more skilled body of workmen than we have at present in the United States. Massachusetts and New York are leading the way in legislation which grants state aid to communities which will establish industrial schools. Michigan certainly should take her place in the van of the industrial education procession. The United States has to overcome a mass of indifference, if not of prejudice, on the part of both employer and employee, before it will enjoy the full blessings of industrial education. The schools of this country have in the past so distinctly disavowed any utilitarian aim that the community does not look for any specific vocational product from them. In fact, a prejudice often exists that the schools train away from every-day life in the workaday world.

Employers look, then, with suspicion on any school which professes to be able to train for the workshop or store. This feeling does not exist in Germany. Manufacturers there have tried the products of the schools long enough to know the advantages to be derived from industrial and continuation schools. The sentiment of the community, therefore, supports the compulsory feature of their laws on this subject. I believe we shall in time establish continuation or part-time schools with compulsory attendance in this country; but before this time comes, we must convince the employer that the product of these schools is enough more valuable than the untrained recruit to justify the law. When the employer is persuaded, it will be no hard task to lead the employee to realize the value of more school training. Since our schools have heretofore made no provision for vocational courses, it is natural for the working man to assume that all his practical training must come from shop work. If the employer requires advanced study of his employees, and if this added knowledge is rewarded with better wages, self-interest will lead the laborer to the industrial school. The German takes his work more seriously than the American. I believe that he also takes a deeper interest in it and that he has a keener sense of pride in ability to excel. Joy in work can come only from skill, and added skill must bring greater joy. The only satisfaction that makes life worth living is that which comes from doing well what one has to do. When it is realized that schools can aid the workman to this satisfaction, they will be welcomed by him, and when the employer sees that schools make his employees more profitable workmen, he, too, will have the same interest in industrial education as the laborer.

APPENDICES

A—STATISTICAL.

B—TYPICAL COURSES OF STUDY.

C—AUTHORITIES.

APPENDIX A—Statistical

TABLE 1 A. TYPICAL LABOR CONDITIONS FOR AGES 14-16
INVESTIGATION MADE IN SUMMER OF 1910

CITY	Firms Canvassed	Personal Convass of				Would have Continued in School had they been taught a Trade				Wood Working		Sewing		Cooking		Both Cooking and Sewing		Miscellaneous Trades		Not Fitted		Average Weekly Wages	
		No. Working		Native		Foreign Born		Boys		Girls		Boys		Girls		Boys		Boys		Girls		Boys	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Detroit . . .	18	74	418	5	75	1	8	0	29	6		11	2	18				1		6	51	\$7.81	\$6.23
Kalamazoo	7	60	43	49	27	11	16	48	33	21	17	7		27	3			2		14	7	\$5.60	\$6.15
Saginaw . . .	4	32	192	22	26	0	3	7		10		†17								12	12	\$5.43	\$5.14

† General Work

TABLE 1 B. WAGES PER WEEK EARNED BY THE ABOVE BOYS AND GIRLS

Amount Per Week	Number of Boys		Number of Girls	
	Boys	Girls	Boys	Girls
\$4.00				18
4.50	6			150
5.00	17			123
5.00-5.50	50			4
6.00	13			189
6.60				8
7.00				50
7.50	6			10
8.00-8.50	42			7

TABLE II. AGRICULTURAL HIGH SCHOOLS, MICHIGAN, 1909-1910

	Hillsdale, Mich.	Hudson, Mich.	Lawton, Mich.	Otsego, Mich.	St. Louis, Mich.	N. Adams, Mich.
Total population of the district	6000	3000	1000	3500	2500	650
Total valuation of the district	\$350,000	\$2,000,000	\$340,000	\$4,000,000	\$2,000,000	\$230,000
School census of the district	1957	540	333	691	552	119
Total No. enrolled in public school	1124	505	240	650	550	153
Total No. enrolled in high school	280	160	67	113	103	79
No. of non-resident students	80	67	26	48	32	51
Of non-residents, number boys	45	42	15	25	26	25
Of non-residents, number girls	35	25	11	23	32	25
Rate of tuition in high school	\$20	\$15.20	\$12	\$19		\$15
Number of boys in each grade	IX X XI XII	IX X XI XII	IX X XI XII	IX X XI XII	IX X XI XII	IX X XI XII
Number of boys taking agriculture	30 35 28 20 30	27 15 9	11 7 5 6	13 6 9 9	20 5 5 4	14 11 6 11
Number of boys taking agriculture	IX X XI XII	IX X XI XII	IX X XI XII	IX X XI XII	IX X XI XII	IX X XI XII
in these grades	16 13 6 5	22 15	6 6 4 4 & 4 girls	6 4 2 6	20 4 0 1	5 6 3 7
Agricultural topics presented	Ag. botany, farm crops, horticulture	Agriculture, Botany, crops, live stock	Ag. botany, crops, Farm mgt., live stock	Horticulture, live stock, dairying, soils, management	Ag. botany, soils, Ag. botany, soils, Horticulture, live crops, horticulture	Ag. botany, soils, Ag. botany, soils, Horticulture, live crops, farm management, dairying, live stock
Total extra cost of instruction in agriculture	\$120	\$100	\$300	none this year	\$200	\$400
Extra cost of apparatus	\$25	\$10	\$10	\$30	0	0
Extra cost of library	\$25	\$15	\$15	\$20	0	\$10
Amount of land used in experimental work	1 city lot	None	Small plot	3½ acres		
Items of experiment	Garden plot planted and maintained		Seed testing, gardening	Gardening, transplanting, forcing pruning, spraying		
No. farms observed during year	3	4	3	5	2	25
Items observed	Gardens, orchards, small fruit	Corn crop, buildings, stock	Stock, grape culture	Growing crops, care and handling, live stock	Soils, crops, live stock	Stock, buildings, orchards, soils, methods of handling manures
Attitude of School to agricultural subjects	Very favorable	Very favorable	Favorable	Good	Good interest aroused	Good
Effect on school of introduction of agricultural work	Tendency to give recognition to Ag. and to dignify the business	Has created new interest in school among the farmer boys	Too early to tell	Growing appreciation	Probably increased the attendance	Increase of interest in both parents & pupils
Does it result in encouraging boys to remain on the farm?	Think it will	Yes	Yes it looks so	In some cases	Too early to tell	Yes
Number farmers enrolled in Ag. Education lecture course	125	75	60	200	100	30
Number lectures given	8	7	6	12	4	5
Average attendance	60	35	22	15	40	25
Topics presented	Orchard, spraying, insect pests, soils, sheep raising, dairying, stock, Very helpful	Insect pests, soils, seed selection feeding dairy cattle, diseases of cattle, Created great interest	Soil fertility, corn, farm mgt.	Tillage, plowing, corn improvement, live stock improvement	Corn improvement, soils, sheep, orchards, commercial fertilizers	Dairying, fertilizers, fruit growing, hog cholera, care of seeds
Effect of this work on the community			Stimulated interest	Good, awakens a live interest	Interested the farmers in the high school.	Better attitude toward the farm.

TABLE III. AGRICULTURAL HIGH SCHOOLS, MINNESOTA

	Albert Lea, Minn.	Camby, Minn.	Glencoe, Minn.	Lewiston, Minn.	Red Wing, Minn.
Total population of the district.....	9000	1700	3000	900 to 1000	12000
Total valuation of the district.....	\$2,500,000	\$440,000	\$550,000	\$340,518	\$3,250,000
Rate of tuition charged in High School.....	None—law giving	state aid forbids	tuition charge		
Total enrollment in High School.....	200	102	151	34	243
Number of boys 14 to 19 enrolled.....	70	36	80	18	90
Number of girls 14 to 19 enrolled.....	110	66	71	14	153
Number of boys in each of the following grades.....	IX X XI XII	IX X XI XII	IX X XI XII	X XI XII	X XI XII
Number of boys taking agricultural subjects in those grades.....	25 20 15 10	18 16 4 6	42 21 10 7	7 7 5 1	32 18 15 22
Extra cost of instruction in agriculture.....	IX X XI XII	IX X XI XII	IX X XI XII	X XI XII	12 Freshmen, 13 Seniors,
Extra cost of apparatus and library.....	18 7	24, total	27 5 4 3	5 5	\$1020
	\$3500	\$1200	About \$1200	\$1140	With school farm,
	\$1500	\$400	\$600	About \$100 or \$150, not counting farm tools.	\$3500
Total per capita cost of education in High School.....	\$80		About \$48		About \$30
Total per capita cost of agriculture in High School.....	\$100		\$30		
Amount of land used in experimental work.....	15 Acres	22 acres	8 $\frac{3}{4}$ acres	6 acres	7 acres
Number of farms observed during the year	8 to 10		About 35		
Items observed on these farms.....	Stock, soils, crops		Corn grow'g, stock, dairy cows, testing milk, feeding dairy cows, drainage, ploughing, cultiv'g	Silo, short horn cattle, houses, sheep, corn, forest trees, weeds	
Estimated number of boys encouraged to remain on the farm because of this instruction.....			Too early to say		
Has a short course of instruction been given in winter for farmers?.....	Four mo. for boys, one week for men, 150 in 1 wk. course	Yes	Yes, young farmers	Yes	Yes
Average attendance.....	80	6	15 12	180 125	100
Length of term.....	One week	3 months	3 $\frac{1}{2}$ months	One week	
Subjects presented.....	Corn stock, poultry Horticulture	Agriculture, wood-work Eng. accts.	Agriculture, farm carpentry, Eng. and Bus. Accts. Excellent		Sat. for ten weeks Plant and animal Husbandry
Effect of this course upon the community	Interest awakened	Small yet	Best possible	Good	
Effect of this course upon the school.....		Small yet		Much interest	

TABLE IV, RURAL DISTRICTS, MICHIGAN

	Branch County	Ionia County	Muskegon County	Saginaw County
School census of boys 14 to 19 outside of cities and villages	800	825	765	1956
Enrollment for boys 14 to 19 in rural schools	450	378	282	489
Number of boys 14 to 19 employed on the farm	200	about 105	About 350	950
Number boys who left farm permanently for other occupations: 1907-1908	14, 15, 16, 17, 18, 19 yrs.	15, 16, 17, 18, 19 yrs.		
Number boys who left farm permanently for other occupations: 1909-1910	4, 8, 10, 15, 20, 20	10, 20, 50, 100, 100 ab't		
Number of boys 14 to 19 attending H. Schools	15, 16, 17, 18, 19 yrs.	15, 16, 17, 18, 19 yrs.		14, 15, 16, 17, 18, 19 yrs.
Number of boys 14 to 19 preparing for College	5, 8, 10, 15, 20	3, 15, 40, 75, 80 ab't	34 from rural schools	49 63 80 75 80 71
Name of one typical township in the county ..	277	About 175	White River	15
School census of township	100?	About 50		Tittabawassee
Number of boys in school census 14 to 19	Guard	Berlin		353
Number of boys 14 to 19 attending rural schools	298	297		50
No. of boys 14 to 19 regularly employed on farm	48	33	46	10
No. of boys 14 to 19 who intend to remain on the farm and who have had no special instruct'n ..	31	10	12	5
Average monthly wages of boys 14 to 19 at farm labor	7	4	25	30
	12	2	25	28
	10 or 15	About 15	25	
	\$20	\$20	\$17	\$20

TABLE V, COUNTY AGRICULTURAL SCHOOLS—Statistics.

COUNTY AGRICULTURAL SCHOOLS	Menominee County, Menominee, Mich.	Dunn County Menomonee, Wis.	Winnebago County Winneconne, Wis.	Marathon County Wausau, Wis.
Amount of land.....	105 acres	160 acres	11 acres	7 acres
Amount invested in land.....		\$12,000	\$2,000	
Amount appropriated for buildings.....		\$35,000	\$36,000	\$17,500
Amount appropriated for equipment.....	About \$1500	\$10,000		
Value of buildings.....	\$37,000	\$50,000	\$38,000	\$2,500 (Estimate)
Value of apparatus and equipment.....	About \$7000	\$10,000		1000
Number of volumes in library.....	208	1000	800	\$50
Estimated value of products from land.....	\$800	12 milk cows	\$200	
Estimated value of live stock.....	\$900	\$12,000		7000
Amount of current expenses for ensuing year.....	\$8200		\$6,700	
Amount of current expenses for year.....	\$7300			
Number of employees other than instructors.....	2	3	1 regular	1
Amount paid such employees.....	\$775		\$600	\$600
Number of boys enrolled.....	18	50	42	17
Number of girls enrolled.....	38	43	36	32
Total number enrolled in the first year.....	35	60	60	36
Total number enrolled in the second year.....	21	33	18	13
Average expense to each student per year.....	\$143.13	\$150	\$135	\$125
Amount expended during the year for permanent improvements.....	\$15,000	\$2,000	\$1,800	\$100
Liabilities.....	\$20,000			
Number of graduates for current year.....	12	32	18, 5 s. c. 13 reg.	1902
Date of establishment.....	July 1, 1907	1903	1907	

TABLE VI, COUNTY AGRICULTURAL SCHOOLS—Instructors.

COUNTY	NAME OF TEACHER	WHERE EDUCATED	SUBJECTS TAUGHT
MENOMINEE, COUNTY MENOMINEE, MICH.	J. F. Wolta..... W. H. McIntosh..... Glady's Jayne..... Isabelle Kaps.....	University of Wisconsin Thomas School Oshkosh Normal	Agricultural Manual Training Dom. Science Academic
DUNN COUNTY MENOMONEE, WISCONSIN	F. R. Lane, M. S..... R. D. West..... Miss N. Fitzgerald..... Miss H. Sulzer..... G. Gilbert, B. S..... Elsie Varley..... Mabel Kafferty.....	M. A. C. Hl. University Stout Institute Stevens Pt. Normal M. A. C. Guelph Agr. College Business College	Agronomy Horticulture Agr. Engineering Dom. Science Academic Animal Husb. Agr. Elements Secy. and Academic
WINNEBAGO COUNTY WINNECONNE, WISCONSIN	G. R. Holton..... Frances R. Heller..... D. O. Thompson.....	Stout Institute Stout Institute University of Wis.	Manual Training Domestic Science Agriculture
MARATHON COUNTY WAUSAU, WISCONSIN	G. A. Crosthwait..... J. A. Bonell..... Hatty R. Dahlberg.....	University of Ill. Stout Institute Stout Institute	Agr. and Academic Manual Training and Acad. Dom. Science and Acad.

NOTE.—This list is given to show the number of teachers needed for work of this sort and also the schools now giving teachers preparation in these lines. Salaries range from \$700 to \$2500.

TABLE VII—MICHIGAN CITIES HAVING MANUAL TRAINING COURSES, 1909-1910

Name of City	TOTAL ENROLLMENT			GRADE ENROLLMENT, GIVEN DATE															
	Boys	Girls	Total	Boys								GIRLS							
				V	VI	VII	VIII	IX	X	XI	XII	V	VI	VII	VIII	IX	X	XI	XII
Adrian	911	883	1794	109	73	67	65	78	72	38	27	105	70	67	66	78	73	38	25
Albion	599	566	1165	55	39	89			10	2		46	48	6	6		13	4	
Ann Arbor		2568	*225	*212	*161	*132													
Battle Creek	2150	2304	4454	187	169	141	126	123	66	41	18	185	172	153	137	140	96	63	49
Bay City	3246	2543	5789	98	4				30	5		9	78				42	2	
Benton Harbor	820	799	1619	86	69	65	53	42	35	11	17	83	74	59	57	66	24	27	29
Bessemer	220	250	470	59	41	52	23	18	13	13	1	55	53	33	22	42	5	24	16
Cadillac	1010	995	2005	86	67	59	37	43	23	17	10	65	85	66	46	49	45	14	13
Calumet	3239	3247	6486	357	371	289	198		2	77		350	317	242	199		4	28	
Charlotte	483	501	984	50	36	35	38	41	32	18	9	45	38	41	39	43	33	31	18
Cheboygan		1541	80	72	44	27	22	12				68	61	64	34	46	30		
Chesaning	152	160	312	11	10	8	11	15	9	6	1	13	11	10	13	16	11	8	5
Coldwater	575	625	1190																
Crystal Falls	600	650	1250	70	60	42	38	18	17	8	6	58	62	49	40	28	19	12	8
Detroit			Data	a	not	rec	eiv	ed											
Escanaba	1279	1322	2601	117	119	24	67	90	62	55	40	93	101	109	85	60	42	35	30
Flint	1844	2126	3970	237	153	101	102	87	39	36	37	251	177	148	127	96	81	72	51
Grand Rapids				670	582	490	347					630	613	525	417				
Hillsdale				54	35	30	34	42	36	30	23	61	39	35	36	48	44	37	20
Holland	894	964	1858	108	112	75	53		4	6		109	92	65	64		9	4	
Houghton	854	879	1733	62	49	53	63	33	29	24	20	57	48	53	58	45	27	29	18
Iron Mountain	1335	1344	2679	147	142	107	80	42	33	19	15	145	118	113	80	39	38	23	18
Ironwood						75	39	44	29	24	13	132	211	102	36	45	38	33	22
Ishpeming	1609	1615	3224	145	143	125	115	89	50	38	28	155	156	119	113	88	65	68	32
Jackson	2118	2191	4309	177	168	142	75	85	61			188	171	120	103	95	75		
Kalamazoo	2634	2773	5407	241	234	256	161	139	74	64	47	226	227	246	217	134	104	87	62
Lansing	2136	2101	4237	Data	a	not	rec	eiv	ed										
Ludington	845	889	1734	69	68	68	44	24	19	15	11	60	75	83	34	29	34	28	22
Manistee	309	343	652	71	72	84	60	2	2			83	85	90	53	3	2		
Manistiquette	428	477	905	42	41	33	32	20	23	14	13	37	44	32	38	44	22	15	12
Marquette				93	90	80	62	39	27	26	10	100	74	81	72	65	56	41	26
Marshall	329	390	719	20	24	26	18	28	15	16	12	15	42	26	23	23	36	29	42
Mt. Clemens	758	650	1408	43	83	82	51		8	3		37	68	51	47		7		
Muskegon					173	93	54	40	27	38					110	79	35	37	37
Negaunee	748	755	1503	44	49	48	45	29	29	3	10	66	56	47	39	31	27	22	18
Niles	507	518	1025	66	44	48	51	23	9	13	13	53	45	45	40	30	25	12	13
Owosso	909	840	1749	96	79	62	41	40	29	15	13	53	67	68	59	60	38	22	23
Port Huron	1584	1496	3080	147	131	116	82	51	48	42	31	134	124	114	92	54	61	40	34
Saginaw, E. S.	2233	2271	4504	245	239	190	160	182	88	59	37	208	244	219	172	176	102	67	53
Saginaw, W. S.	1531	1504	3035	160	152	116	118	75	27	28	5	151	147	140	132	102	39	24	24
Sault Ste Marie	1150	1190	2340	103	92	73	68	62	37	33	26	101	94	72	73	67	32	35	28
St. Johns	366	386	752	37	19	28	23	30	20	13	10	38	24	32	28	50	26	17	13
St. Joseph	458	478	936	39	44	42	34	34	11	11	11	44	95	78	76	33	19	14	13
Three Rivers	456	489	945	44	42	35	20	28	21	9	12	61	39	31	25	33	29	17	18
Traverse City	314	312	626	101	59	63	64		2	7		98	68	65	72		2	5	
Wyandotte	368	395	763	46	23	39	13	17	13	9	4	47	32	29	21	17	15	5	6

*Boys and Girls.

NOTE.—The enrollment given in the first three columns was asked for as "Total Enrollment"; Enrollment by Grades was asked on the given date, February 4, 1910. It is understood that all pupils enumerated in Grades V-VIII have the kind of manual work mentioned under courses of study. In most schools high school courses in manual training are optional; hence the high school figures do not show manual training enrollment.

TABLE VIII, MANUAL TRAINING IN MICHIGAN CITIES

COST 1909-1910

	Original Cost of Apparatus		Yearly Repair Renewal		Yearly Supplies		Yearly Instruction		Per Capita Cost	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Adrian	\$400 to	\$400 to								
Ann Arbor	\$500	\$500	\$150	\$100	\$100	\$150	\$1000	\$1100	\$1.8	7½
Bay City	\$2150	\$500			\$265	\$200	\$1250	\$1400		
Battle Creek	\$2953.31		\$14	5	\$74	2	\$32	00		
Bessemer	\$300	\$500			\$75	\$150	\$350	\$350		
Benton Harbor	\$150	\$450					\$900	\$650		
Crystal Falls	\$1500	\$1200			\$125	\$130	\$1000	\$850	\$14.58	\$11.73
Charlotte	\$19	50			\$15	0	\$60	0		
Cheboygan	\$400	\$250			\$15	0	\$900	\$650	\$10.42	\$5.51
Chesaning					\$62	.05				
Detroit	\$867	3.85								
Flint	\$150	00, exte	nsions							
Grand Rapids	\$500	\$475	\$25	\$15	\$75	\$125	\$950	\$650	\$1.98	\$1.05
Houghton	\$749	\$1370.09					\$23276	.60		
Ironwood	\$52	00	\$30	0	\$60	0	\$18	00		\$1.65
Iron Mountain	\$180	00	\$150				\$2150			
Ishpeming	\$1000	\$500	\$50	\$20	\$419	\$408	\$1200	\$850		
Jackson	\$3500	\$1500			\$80	0	\$29	75	\$1.25	\$3.00
Kalamazoo	\$3000	\$2000	extensions							
Ludington	\$1500	\$800	\$60	0.00	\$102	9.13	\$7,79	1.50		
Manistee	\$3247	\$2100	\$10	\$4.65	\$224.81	\$118.45	\$825	\$525		
Muskegon	\$33,79	5.62	\$65	5.97	\$452.72	\$369.27	\$1150	\$1150	\$1.30	\$1.07½
Marquette			\$200		\$237	9.22	\$16,59	8.50	\$39.	37
Marshall	\$300		\$2	5	\$300	\$200	\$2100	\$1400		
Negaunee	\$2500	\$1000			\$10	0	\$65	0	\$1.	25
Owosso	\$475	\$475	\$25	\$2.00	\$80.25	\$96.77	\$1000	\$850	\$3.35	
Port Huron	\$650	\$50	\$25		\$125	\$123	\$800	\$550		
St Johns	\$243	\$21	\$9		\$200	\$50	\$1000	\$650	\$2.55	\$1.50
Sault Ste. Marie	\$1000	\$500			\$21	\$4	\$105	\$105	\$3.23	\$1.32
Saginaw E. Side	\$36.18	9.94			\$2.38*	\$2.46*	\$1300	\$700	\$17.98	\$12.06
Saginaw W. Side	\$2000	\$600	\$50	\$25	\$1030	\$700	\$1675	\$1375	\$23.77	\$12.23
Traverse City	\$895	\$552.50			\$800	\$600	\$2525	\$1675		
Three Rivers					\$160	\$258.80	\$800	\$650	\$2.54	\$1.93
Wyandotte	\$500				\$24	0				

*Per Capita.

NOTE.—An effort was made to secure the cost of the different items, apparatus, material, instruction, etc., grade by grade; much interesting information was received, but not enough to make a useful comparative table. We have therefore tabulated totals and averages only, though dividing the cost of courses for boys and courses for girls wherever that information was given.

TABLE IX, MANUAL TRAINING IN MICHIGAN

SPECIAL INSTRUCTORS EMPLOYED 1909-1910

CITY	INSTRUCTORS OF BOYS		INSTRUCTORS OF GIRLS		TOTAL INSTRUCTORS.
	M.	F.	Dom. F.	Sc. F.	
Albion	1		1	1	3
Ann Arbor		1	1	1	3
Adrian		1	1	1	3
Battle Creek	2	$\frac{1}{2}$	$1\frac{1}{2}$	1	5
Benton Harbor	1		$\frac{1}{2}$	$\frac{1}{2}$	2
Bay City	1		1	$\frac{1}{2}$	3
Bessemer		1	$\frac{1}{2}$	$\frac{1}{2}$	2
Calumet	7		3		10
Cheboygan	1			1	2
Coldwater		1	$\frac{1}{2}$	$\frac{1}{2}$	2
Crystal Falls	1		1		2
Charlotte	1				1
Detroit	17		11	18	46
Flint			1	1	2
Escanaba			1	1	2
Grand Rapids	6		6	14	26
Houghton	1		1		2
Holland		1		1	2
Hillsdale		1	1	1	3
Ironwood	2		2	2	6
Iron Mountain	1		$\frac{1}{2}$	$\frac{1}{2}$	2
Ishpeming	3		2	1	6
Jackson	2	1	1	2	6
Kalamazoo	4	1	$2\frac{1}{2}$	$2\frac{1}{2}$	10
Ludington		1	$\frac{1}{2}$	$\frac{1}{2}$	2
Lansing		1	1	1	3
Muskegon	11		3	4	18
Manistee	1	1	2 (1 assist in night cl.)		4
Marquette	2			2	4
Marshall		1		1	2
Manistique			$\frac{1}{2}$	$\frac{1}{2}$	1
Negaunee		1	$\frac{1}{2}$	$\frac{1}{2}$	2
Owosso	1		$\frac{1}{2}$	$\frac{1}{2}$	2
Port Huron	1			1	2
St. Johns		1			1
St. Joseph		1			1
Sault Ste. Marie		1	$\frac{1}{2}$	$\frac{1}{2}$	2
Saginaw, W. S.	2		2	1	5
Saginaw, E. S.	7	1	$4\frac{1}{2}$	$4\frac{1}{2}$	17
Traverse City	1		$\frac{1}{2}$	$\frac{1}{2}$	2
Wyandotte		1			1
					220

TABLE X. MANUAL TRAINING IN MICHIGAN
Courses by Grades

BOYS																GIRLS															
NAMES	V	VI	VII	VIII	IX	X	XI	XII	V	VI	VII	VIII	IX	X	XI	XII															
Card Whittling Wood	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING																	
Adrian	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Albion	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Ann Arbor	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Battle Creek	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Bay City	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Benton Harbor	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Bessemer	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Cadillac	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Calumet	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Charlotte	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Cheboygan	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Chesaning	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Coldwater	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Crystal Falls	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Detroit	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Escanaba	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Flint	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Grand Rapids	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Hillsdale	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Holland	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Houghton	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Iron Mountain	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Ironwood	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Ishpeming	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																
Jackson	WOOD	WOOD	WOOD	WOOD	WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	COOKING	COOKING	COOKING																

TABLE X. MANUAL TRAINING IN MICHIGAN
Courses by Grades

NAMES	BOYS							GIRLS								
	V	VI	VII	VIII	IX	X	XI	XII	V	VI	VII	VIII	IX	X	XI	XII
Kalamazoo ..	MECH. DRAW. WHITTLING		ELEMEN TARY CARPENTRY		ART MECH.	WORK or DRAWING	WOODTURNING PATTERN MAKING	FORGING	ELEMEN TARY SEWING		COOKING		ART	WORK		ADVANCED DRESSMAKING
Lansing	CARD BOARD CONSTRUCTION		CARPENTRY		SHOP MECH. BENCH	WORK DRAW. WORK			SEWING	SEWING	COOKING					
Ludington	KNIFE SLOID		SHOP BENCH		WORK MECH. BENCH	WORK			SEWING	SEWING	COOKING	COOKING	COOKING	Cook. and Sew.		
Manistiquie ...			WOOD		JOINERY Cab. Mak. Mech. Dr. WOOD	TURNING Pat. Mak. Draw. WOOD	Forging Draw. WOOD		SEWING	SEWING	COOKING	COOKING	COOKING	COOKING	Cook. and Sew. ADV. COOKING	
Marquette			WOOD		WOOD	WOOD			SEWING	SEWING	COOKING	COOKING	COOKING	COOKING	SEWING	Sew. COOKING
Marshall	Bent Iron	WOOD	WORK		WOOD	WOOD			SEWING	SEWING	Sew. Knit. Crochet.	Basketry Sewing	Sew.			
Mt. Clemens	KNIFE	WORK	Bench Work		CABINET MAKING PATTERN MAKING and JOINERY	TURNING Pat. Mak. Mech. Dr. WOOD	Forging and Iron Work		SEWING	SEWING	Raffia and Sewing Sew.	ELEM. Cook. and Sew.	Cook. and Dressmak. WING	Laundry and Dressmak. WING	Hygiene and Sanitation COOKING	Home Decoration and Dietetics COOKING
Muskegon	Thin woodwork Constr.	WOOD	WOOD		CABINET MAKING PATTERN MAKING and JOINERY	TURNING Pat. Mak. Mech. Dr. WOOD	Forging and Iron Work		SEWING	SEWING						
Negaunee			WOOD		CABINET MAKING PATTERN MAKING and JOINERY	TURNING Pat. Mak. Mech. Dr. WOOD	Forging and Iron Work		SEWING	SEWING						
Niles	MECH. ANICAL DRAWING		WOOD		WOOD	WOOD			SEWING	SEWING						
Owosso	Iron Work	WOOD BENCH	WORK		WOOD	WOOD			SEWING	SEWING	DOMESTIC SEWING				SCIENCE	
Port Huron	Raffia	WOOD	BENCH		Cabinet Work Wood Turn. Bench Work	PATTERN MAKING Foundry	Wood Work and Iron		SEWING	SEWING	COOKING	COOKING	Laundry Sewing Nursing	ooking Sewing	Cooking and Serving	Cooking and Serving
Saginaw, E. S. .	KNIFE	WORK	BENCH		WOOD Turn. Bench Work	WOOD	Wood Work and Iron		SEWING	SEWING	Sew.	Mech. Draw.	SEWING CHEMISTRY OF FOODS, ETC.	ooking Sewing	Cooking and Serving	Cooking and Serving
Saginaw, W. S. .	Card. Constr.	Thin Wood Constr. WORK	Bench		WOOD	WOOD			SEWING	SEWING	COOKING	COOKING	COOKING	COOKING		Cook.
Sault Ste Marie	TRAY	WOOD	BENCH		WOOD	WOOD			SEWING	SEWING	COOKING	COOKING	COOKING	COOKING		
St. Johns	Bent Iron	BENCH	BENCH		WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	SEWING	SEWING		
St. Joseph		BENCH	BENCH		WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	SEWING	SEWING		
Three Rivers ..		BENCH	BENCH		WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	SEWING	SEWING		
Traverse City ..	DRAWING and KNIFE	WOOD	CARPENTRY		CARPENTRY MECH. BENCH	WOOD	WOOD		SEWING	SEWING	SEWING	SEWING	SEWING	SEWING	COOKING HOUSE	COOKING SAN.
Wyandotte	Iron and Carv.	WOOD	BENCH		WOOD	WOOD			SEWING	SEWING	SEWING	SEWING	SEWING	SEWING		

TABLE XI, TRADE SCHOOLS

	Detroit	Islepening	Saginaw East Side	Stout Institute, Menomonee, Wis.	Detroit Technical Institute, Detroit
1. Have you a trade school in connection with the public school?	No, but preliminary trade instruction is offered in one of the large grammar schools	Yes	Yes	Yes	Yes
2. State character of the building		Three story, 110x66 \$40,000	No separate building. Manual training School. \$240,000	\$300,000 (Cost of entire plant)	Brick \$15,000
3. Cost of Building.....		\$10,000	No separate equipment	Near public High school, Menomonee	\$3000
4. Cost of Equipment		Adjoins high School. 5 min. walk from 7th and 8th grades	One Journeyman machinist, 1 year in H.S. \$900 per year	Experienced journeymen \$42,000 annually*	Adams and Wetherell Sts.
5. Location of Buildings.....		College C. B. and M. T. \$2150	Yes	Yes	Three
6. Number of Instructors.....		Yes	15 yrs. old, regardless of grade	Fifth grade, up	Yes
7. Character and training of instructors.....		Seventh	Yes	Yes	Young men 16 or more
8. Expenses for instruction.....		No.	Yes	Yes	Yes
9. Are students permitted to enter before completing high school course?		Eleven	From 15 up	16 up	16 up
10. To what grade is the trade school open?		Not at present	Not for this class	Yes	Yes
11. Do any students who do not regularly attend the public school attend trade school? How many?		445	27	27	75
12. Between what ages are students permitted to enter?	Yes, in manual training schools. Four per week? 542	18	Machinist	Blacksmithing and Carpentry (gr. 5-8) Brick-laying and Plumbing	Plumbing, watch-making, engraving
13. Do you have night sessions? How many per week?	Joinery, pattern-making, woodturning, blacksmithing, machine shop practice, mechanical drawing	No objection Good	At first not friendly!	Good	Good
14. Number of students attending.....	Favorable	About \$3 per day		\$2 to \$3 per day in a short time	
15. Average age of students completing course?					
16. What trades are taught?					
17. Attitude of trade unions toward trade schools.....					
18. General effect upon students.....					
19. Wages received by students graduated from such school (a) first year,					

* Total for Institute.

APPENDIX B—Typical Courses

B. 1. AGRICULTURAL COURSES.

STATE AGRICULTURAL HIGH SCHOOL, McINTOSH, MINN.

Special Agricultural Course.

First (D) Year—First Term.

Botany 5
Farm Arithmetic 5
Agriculture 5
English 5
Study of Breeds 2 (2)
Carpentering 2 (2) or Sewing 2 (2)
Mechanical Drawing 1 (2) or Drawing 1 (2)

Second Term.

Civics 5
Business Forms and Accounts 5
Agriculture 5
English 5
Dairying 2 (2)
Carpentering 2 (2) or Sewing 2 (2)
Mechanical Drawing 1 (2) or Drawing 1 (2)

Second (C) Year—First Term.

Physiology 5
Agriculture 5
Commercial Geography 5
English 5
Poultry 2 (2)
Blacksmithing 2 (2) or Cooking 2 (2)
Mechanical Drawing 1 (2) or Laundering 1 (2)

Second Term.

Entomology and Zoology 5
Agriculture 5
Agricultural Physics 5
English 5
Vegetable Gardening 2 (2)
Blacksmithing 2 (2) or Cooking 2 (2)
Mechanical Drawing 1 (2) or Household Art 1 (2)

In addition, work in music, physical culture and literary society or rhetoricals will be required.

THE MURRAY STATE SCHOOL OF AGRICULTURE,

Tishomingo, Oklahoma.

COURSE IN AGRICULTURE.

(Boys).

SUBJECTS AND HOURS.

"C" Year.

FALL TERM.	WINTER TERM.	SPRING TERM.
Arithmetic 5	Algebra 4	Algebra 4
English 5	English 5	English 5
Physiology 4	Physiology 4	Civics 5
Agri. Botany... 3 (2)	Breeds of Ani-	Breeds of Ani-
Drawing (2)	mals 3 (4)	mals 3 (4)
Carpentry (4)	Drawing (2)	Drawing (2)
Stock Judging.. (2)	Carpentry (4)	Carpentry (4)

"B" Year.

Algebra 5	Algebra 5	Algebra 5
English 4	English 4	English 4
History 4	History 4	Agr. Physics... 4 (2)
Veg. Gardening 3 (2)	Soils and Fertil-	Farm Crops... 3 (2)
Agri. Practice.. (2)	izers 3	Drawing Farm
Drawing Farm	Farm Dairying. 1 (4)	Plans (2)
Plans (2)	Drawing Farm	Blacksmithing.. (4)
Blacksmithing.. (4)	Plans (2)	
	Blacksmithing.. (4)	

"A" Year.

English 4	English 4	English 4
Geometry 5	Geometry 4	Geometry 5
Forestry 3	Feeding and	Feeding and
Farm Economics 3	Man. Farm	Man. Farm
Farm Machinery	Animals 3 (2)	Animals 3 (2)
and Imple-	Fruit Growing.. 3	Entomology 3
ments 1 (2)	Farm Dairying. (4)	Diseases & Care
Road Making.. 1 (2)	Road Making.. 1 (2)	of Farm Ani-
Plant Propaga-	Agri. Practice.. (2)	mals 3
tion (2)	Farm Accounts. (4)	Agri. practice... (2)
Agri. Practice.. (2)		

Figures indicate number of recitation hours per week.

Figures in parenthesis indicate hours of practical work per week.

THE MURRAY STATE SCHOOL OF AGRICULTURE,

Tishomingo, Oklahoma.

COURSE IN DOMESTIC ECONOMY.

(Girls).

SUBJECTS AND HOURS.

"C" Year.

FALL TERM.	WINTER TERM.	SPRING TERM.
Algebra 4	Algebra 4	Algebra 4
Arithmetic 5	English 5	English 5
English 5	Physiology 4	Civics 5
Physiology 4	Social Culture.. 1	Social Culture.. 1
Agr. Botany.... 3 (2)	Laundry (2)	Drawing (2)
Drawing (2)	Drawing (2)	Cooking (4)
Cooking (4)	Cooking (4)	Sewing (4)
Sewing (4)	Sewing (4)	

"B" Year.

Algebra 5	Algebra 5	Algebra 5
English 4	English 4	English 4
History 4	History 4	Farm Crops.... 3 (2)
Veg. Gardening 3 (2)	Farm Dairying. 1 (4)	Drawing (2)
Drawing (2)	Drawing (2)	Household Art.. 1
Household Art.. 1	Household Art.. 1	Cooking (4)
Cooking (4)	Cooking (4)	Sewing (4)
Sewing (4)	Sewing (4)	

"A" Year.

English 4	English 4	English 4
Geometry 5	Geometry .. . 4	Geometry 5
Forestry 3	Farm Accounts. (4)	Entomology 3
Plant Propaga- tion (2)	Farm Dairying. (4)	Home Economy. 2
Invalid Cookery (4)	Home Managem't 1	Floriculture 1
Domestic Hygiene 2	Domestic Chem. (4)	Dressmaking .. (4)
Home Nursing.. 2	Millinery (4)	

Figures indicate number of recitation hours per week.

Figures in parenthesis indicate hours of practical work per week.

NEW YORK STATE SCHOOL OF AGRICULTURE AT ALFRED UNIVERSITY, ALFRED, N. Y.

First Year.

TERM I.

BOYS.		BOYS AND GIRLS.		GIRLS.	
Farm Dairying.....	4	Botany	3	Cooking I.....	3
Forge Work.....	5	Physics	3	Sewing I.....	2
Cement Work.....	1	Arithmetic	2	Drawing I.....	2
		English I.....	3	Agriculture	3
		Music I.....	1		

TERM II.

Breeds	4	Chemistry I.....	3	Agriculture	3
Drawing	4	Hygiene	3	Cooking II.....	2
		Farm Accounts.....	2	Sewing II.....	3
		English II.....	4	Laundry	1
		Rural Sociology.....	1		
		Music II.....	1		

Second Year.

TERM III.

Farm Crops.....	5	Butter Making.....	3	Cooking III.....	3
Woodworking I....	4	Chemistry II.....	3	Sewing III.....	3
Farm Surveying....	2	English III.....	3	Drawing II.....	3
		Poultry	2	Millinery I.....	2

TERM IV.

Climate and Soil		Cheese Making.....	3	Cooking IV.....	2
Studies	5	General History....	3	Sewing IV.....	3
Woodworking II....	4	English IV.....	2	Millinery II.....	1
Stock Judging.....	2			Food Studies.....	3
Fertilizers	2			House Plans.....	2
Poultry	2				

Third Year.

TERM V.

Forestry	2	Plant Diseases.....	3	Cooking	2
Feeds and Feeding..	4	Gardening	2	Sewing	3
Breeding	3	General History.....	5	Home Nursing.....	3
Creamery Practice..	2	Music III.....	1	Food Adulteration..	1
Farm Machinery....	2			Household Bact'gy..	1

TERM VI.

Orcharding	3	Insect Pests.....	3	Cooking	2
Dressing and Curing		Landscape Garden-		Sewing	2
of Meats.....	1	ing	2	Home Sanitation....	2
Veterinary Studies..	3	Civics	2	Home Decoration....	2
Farm Building.....	4	Farm Law	1	Art Needlework....	2
Farm Management..	2	Music IV.....	1	Household Manage-	
				ment	2

**FIFTH DISTRICT AGRICULTURAL SCHOOL AND EXPERIMENT
STATION, WETUMKA, ALABAMA.
AGRICULTURAL SCIENTIFIC COURSE.**

First Term. First Class.

	Hours per week
Agriculture—Duggar's	3
Agriculture—Practical work.....	1
Science—Physiography	2
History—English History.....	3
Mathematics—Arithmetic	5
Mathematics—Algebra	5
English—Grammar reviewed.....	5
Spelling	
	<hr/> 24

Second Term.

Agriculture—Duggar's "Agriculture for Southern Schools".....	3
Agriculture—Practical work.....	1
Science—Physiography	2
History—English History.....	3
Mathematics—Arithmetic	5
Mathematics—Algebra	5
English—Rhetoric and Composition.....	5
Spelling	
Commercial Geography —Olin's.....	
	<hr/> 24

Second Class. First Term

Agriculture—Soils and Crops.....	5
Agriculture—Practical work.....	1
Science—Physiology	4
History—Ancient History.....	3
Mathematics—Algebra	5
English—Rhetoric and Composition.....	5
Spelling	
	<hr/> 23

Second Term.

Agriculture—Botany	5
Agriculture—Practical work.....	1
Science—Physiology	4
History—Ancient History.....	3
Mathematics—Algebra completed.....	5
English—Rhetoric and Composition.....	5
Spelling	
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COURSE IN AGRICULTURE FOR HIGH SCHOOLS AND ACADEMIES IN MAINE.

Adaptation of the Standard English Course of Study for Maine Schools

First Year.

English	3 hrs.
Algebra	5 hrs.
Chemistry	5 hrs.
Soils, Plant Life, Fertilizers.....	3 hrs.
Practicums. Two afternoon periods of 2 hours each.	
School Gardening.	

Second Year.

English	3 hrs.
Geometry	5 hrs.
History and Civil Government.....	5 hrs.
Live Stock, Dairying, Poultry.....	3 hrs.
Practicums. Two afternoon periods of 2 hours each.	
School Gardening.	

Third Year.

English	3 hrs.
Physics	5 hrs.
History	5 hrs.
Field Crops, Fruit Growing, Vegetable Gardening.....	3 hrs.
Practicums. Two afternoon periods of 2 hours each.	
School Gardening.	

Fourth Year.

English	3 hrs.
Reviews	5 hrs.
Commercial Arithmetic, Bookkeeping, etc.....	3 hrs.
Agricultural Engineering, Farm Mechanics, Farm Management, Plant Diseases, Economic Entomology.....	
School Gardening.	

NOTE.—The number of hours per week in the above course of study is not so large as to prevent the election of other studies in the high school courses.

GUTHRIE COUNTY HIGH SCHOOL, PANCRA, IOWA.

AGRICULTURAL COURSE.

Sophomore Year.

FIRST SEMESTER

Algebra
English
Ancient History
Animal Husbandry
Feeds and Feeding

SECOND SEMESTER

Algebra
English
Medieval and Modern History
Animal Husbandry
Agronomy
Bookkeeping

Junior Year.

Algebra
German
Physics
Geology
Farm Mechanics

Plane Geometry
German
Physics
Geology
Farm Mechanics

Senior Year.

Plane Geometry
German
Political Economy
Chemistry
Soils

Solid Geometry
German
English
Chemistry
Soils
Horticulture

Freshman Year—All Courses.

Arithmetic
Algebra
American History
Civics
Physiology
Latin
English

THE JOHN SWANEY SCHOOL, PUTNAM COUNTY, ILLINOIS.

First Year.

FIRST SEMESTER

English I
Algebra
Physiology
Agronomy I, or Latin
Household Science or
Manual Training

SECOND SEMESTER

English I
Algebra
Physical Geography
Horticulture or Latin
Household Science or
Manual Training

Second Year.

English II
Algebra
Geometry
Zoology
Ancient History
Drawing

English II
Geometry
Botany
Ancient History
Animal Husbandry or House-
hold Science, 10 weeks
Music

Third Year.

English III
Chemistry
Animal Husbandry or Latin or
Household Science
English History

English III
Chemistry
Agronomy II, or Latin or
Household Science
English History

Fourth Year.

English IV
Physics
Household Science, or
Agronomy III
American History
Latin III

English IV
Physics
Bookkeeping, 10 weeks
Arithmetic, 10 weeks
Civics
Latin III

COUNTY SCHOOL OF AGRICULTURE, MENOMINEE, MICHIGAN.

First Year Class.

FIRST SEMESTER.

FOR MEN.	FOR MEN AND WOMEN.	FOR WOMEN
Stock Judging (3)	Plant Life (3)	Sewing (5)
Field Crops (2)	Arithmetic (5)	Cooking (5)
Practice in Field	Grammar (3)	Food Study (3)
Work (1)	Spelling (4)	
Carpentry (5)		
Mechanical Drawing (3)		

SECOND SEMESTER.

Soils and Fertilizers (3)	Flower, Fruit and	Cooking (5)
Insects and Weeds (2)	Vegetable Garden-	Sewing (5)
Feeds and Feeding (3)	ing (4)	Household Hygiene (2)
Carpentry (5)	Poultry (1)	
Mechanical Drawing (3)	Business Correspond-	
Practical Mechanics (2)	ence (3)	
	Arithmetic (5)	
	Composition (3)	
	Spelling (4)	

Second Year Class.

FIRST SEMESTER.

Agricultural Chemis-	Domestic Art (5)	Domestic Art (5)
try (4)	Dairying (4)	Laundry (2)
Drainage (1)	Farm Accounts (4)	Dietaries (3)
Stock Judging Adv. (3)	U. S. History (3)	Sewing (5)
Field Crops Adv. (2)	Emergencies (1)	Home Decoration (2)
Practice in Field		
Work (1)		
Carpentry Adv. (5)		
Rural Architecture (1)		

SECOND SEMESTER.

Farm Management (2)	Landscape Garden-	Agricultural Chemis-
Judging and Grading	ing (1)	try (3)
Grain (3)	Civics (3)	Home Nursing (1)
Animal Husbandry (3)	Commercial Geogra-	Serving (1)
Practice in Field	phy (3)	Sewing (5)
Work (1)	Thesis (1)	Millinery (2)
Farm Machinery (2)		
Cabinet Making (5)		
Smithing (3)		

Writing and Music are given one period a week each for the entire school year to all students.

DUNN COUNTY SCHOOL OF AGRICULTURE, MENOMONIE, WIS.

Junior Year.

QUARTER No. I.

FOR MEN.	FOR MEN AND WOMEN.	FOR WOMEN
Soil (2)	English (5)	Cooking (3)
Dairy Husbandry (2)	Math. 1 (Physics) (3)	Sewing (2)
Stock Judging (1)	Spelling (daily)	Freehand Drawing (2)
Types of Animals (1)	Arithmetic (daily)	Household Chemistry(1)
Wood Shop (4)		
Concrete Construction(1)		

QUARTER No. II.

Fertilizers (2)	English (5)	Cooking (3)
Dairy Husbandry (2)	Bookkeeping (3)	Sewing (2)
Stock Judging (1)	Spelling (daily)	Laundry (1)
Types of Animals (1)	Arithmetic (daily)	Textiles (2)
Drawing & Woodshop(4)		Needlework (2)

QUARTER No. III.

Math. 2 (Geom.) (3)	English (4)	Cooking (3)
Dairy Husbandry (2)	Poultry (2)	Sewing (2)
Stock Judging (1)	Physiology (3)	Hygiene (3)
Types of Animals (1)		Wood Shop (4)
Wood Shop (4)		Millinery (1)

QUARTER No. IV.

Animal Husbandry (2)	English (4)	Cooking (3)
Stock Judging (1)	Chemistry (5)	Sewing (3)
Types of Animals (1)	Botany (3)	
Blacksmith Shop (4)	Vegetable Gardening (2)	

Senior Year.

QUARTER No. I.

FOR MEN.	FOR MEN AND WOMEN.	FOR WOMEN.
Farm Crops (4)	English (3)	Food Study (3)
Feeds and Feeding (3)	Building Plans (4)	Cooking (3)
Stock Judging (1)	Horticulture (1)	Sewing (2)
Blacksmith Shop (4)		Millinery (2)

QUARTER No. II.

Farm Crops (4)	English (2)	Food Study (3)
Principles of Breeding (4)		Cooking (3)
Stock Judging (1)		Sewing (2)
Drafting Buildings (2)		Household Bacteriology (2)
Power Machinery (1)		Home Economics
Blacksmith Shop (4)		

QUARTER No. III.

Seeds and Germination (3)	English (2)	Cooking (3)
Birds and Insects (2)	U. S. History (3)	Sewing (2)
Animal Husbandry (2)	Shrubs and Trees (3)	Home Nursing (3)
Stock Judging (1)	Emergencies (2)	Food Adulteration (2)
Field Machinery (4)		

QUARTER No. IV.

Orcharding (2)	English (2)	Cooking (2)
Spraying (2)	Civics (3)	Millinery (3)
Dairy Husbandry (2)	Landscape Gardening (3)	Home Sanitation (2)
Animal Husbandry (2)		Home Decoration (3)
Mathematics 3 (2)		
Stock Judging (1)		

Credits necessary to graduate, 140.

BEATRICE HIGH SCHOOL, NEBRASKA.

Latin	German	English	Commercial
Algebra	Algebra	Algebra	Algebra
Physical	Physical	Physical	Physical
Geography	Geography	Geography	Geography
English	English	English	English
Latin	German	Word Analysis and Spelling	Writing and Spelling

I.

Algebra	Algebra	Algebra	Algebra
Agriculture	Agriculture	Agriculture	Agriculture
English	English	English	English
Latin	German	Commercial Geography	Commercial Geography
Algebra	Algebra	Algebra	Algebra
Greek History	Greek History	Greek History	Greek History
English	2 English	2 English	2 English
Botany	2 Botany	3 Botany	3 Botany
Latin	German	Commercial Arithmetic	Commercial Arithmetic

II.

Geometry	Geometry	Geometry	Geometry
Roman History	Roman History	Roman History	Roman History
English	2 English	2 English	2 English
Botany	3 Botany	3 Botany	3 Botany
Latin	German	Commercial Arithmetic	Commercial Arithmetic

A COURSE IN AGRICULTURE FOR THE HIGH SCHOOLS OF MICHIGAN.

9th Grade	10th Grade	11th Grade	12th Grade
English	English	Literature and	Literature and
Algebra	Geometry	Composition	Rhetoric
Arithmetic and	General History	Physics	Chemistry
Bookkeeping		Commercial Ge- ography.	Amer. History and Civics
		Zoology	
Botany $\frac{1}{2}$	Crops $\frac{1}{2}$ and Ele-	Live Stock, types	Live Stock, im-
Agricultural	mentary Soils $\frac{1}{2}$	and breeds	provement, feed-
Botany $\frac{1}{2}$	Horticulture $\frac{1}{2}$	Dairying $\frac{1}{2}$	ing $\frac{1}{2}$
	Entomology	Soils $\frac{1}{2}$	Poultry
	$\frac{1}{2}$		Farm Management
			Farm Mechanics
			Farm Machinery

B. 2. INDUSTRIAL COURSES.

Bulletin No. 11 (National Society for the Promotion of Industrial Training) gives abundant information regarding the courses now given in different kinds of schools. Typical elementary vocational Schools for Boys are:

The Newton Independent Industrial School (see p. 14, Bulletin, 11).

The Rochester Factory School (p. 21, Bulletin 11).

Schools of the same type for girls are:

The Manhattan Trade School for Girls (pp. 29 and 30, Bulletin).

Milwaukee School of Trades for Girls (p. 33, Bulletin).

An advantage in the Newton course is the testing of boys in shop work of three or four sorts in the first year; the shop work of the next two years is specialized. Typical Secondary Schools are:

Lewis Institute, Chicago (pp. 61-63, Bulletin).

Milwaukee School of Trades (pp. 22-30, Bulletin).

The Auchmughty Schools, N. Y. (p. 42, Bulletin).

The Cleveland Technical High School (pp. 57 and 58, Bulletin).

To this reference list we add the courses of certain other schools of the several types.

SAGINAW TRADE SCHOOL.

First Year.

Iron work	5 recitations a week, 75 m. per recitation
Wood Work	5 recitations a week, 75 m. per recitation
Mechanical Drawing	5 recitations a week, 75 m. per recitation
Arithmetic	5 recitations a week, 60 m. per recitation
Eng. (Civies)	5 recitations a week, 45 m. per recitation

Second Year.

Iron Work.....	10 recitations a week
Drawing.....	5 recitations a week
Mathematics.....	5 recitations a week
English (Hygiene, Business Forms, Accounts, etc.)..	5 recitations a week

Third Year.

Iron Work.....	10 recitations a week
Drawing.....	5 recitations a week
Mathematics and Science (Physics and Chemistry)...	5 recitations a week
English (Study of Iron and Steel).....	5 recitations a week

FITCHBURG PART TIME SCHOOL

(In this and succeeding courses the number at the right of each subject indicates the number of recitation periods per week.)

First Year.

ALL SCHOOL WORK.

English	5
Mathematics, tables and simple shop problems.....	5
Mechanics—simple machines.....	5
Freehand and Mechanical Drawing.....	5
Current Events.....	2

Second Year.

SCHOOL AND SHOP WORK.

English	4.
Shop Mathematics.....	5
Physics	4
Mechanism of Machines.....	4
Freehand and Mechanical Drawing.....	8

Third Year.

SHOP AND SCHOOL WORK.

English	4
Shop Mathematics.....	5
Physics-Chemistry	3
Mechanism of Machines.....	4
Commercial Geography and Business Methods.....	1
Freehand and Mechanical Drawing.....	8

Fourth Year.

SCHOOL AND SHOP WORK.

English	4
Civics and American History.....	2
Shop Mathematics.....	5
Mechanism of Machines.....	5
Electricity and Heat.....	4
Freehand and Mechanical Drawing.....	5

The school is open 40 weeks in the year.

NEWTON, MASS., TECHNICAL HIGH SCHOOL.

Technical Course.

Purpose of the Course.—This course prepares for admission to all normal schools; it gives an all-round academic education.

First Year.		Third Year.	
	Periods		Periods
English	5	English	4
History, ½ year		Chemistry	6
Science, ½ year		ELECT TWO.	
.....	5	Algebra and Geometry.....	4
Singing and Physical Training.	2	Commercial Geog. and History.	4
ELECT ONE.		French	4
Algebra	5	German	4
French	5	Latin	5
German	5	ELECT ONE GROUP.	
Latin	5	Pattern Making and	
ELECT ONE GROUP.		Molding, ½ year	
Cabinet Making and			6
Wood-turning	6	Machine Shop Practice, ½ year.	6
Mechanical Drawing.....	4	Mechanical Drawing.....	4
Household Economics.....	6	Household Economics.....	6
Design	4	Design	4
Second Year.		Fourth Year.	
English	4	English	4
ELECT TWO.		Am. History and Government..	4
History	4	Arithmetic and Accounts.....	2
Geometry	4	Visit to Shops, Factories, Mu-	
French	4	seums.	
German	4	ELECT TWO.	
Latin	5	French	4
ELECT ONE GROUP.		German	4
Physics	5	Latin	5
Light Machine and Vise		Physics	5
Work, ½ year		Advanced Chemistry.....	6
Forging, ½ year		Physiology and Hygiene.....	4
.....	6	Biology	5
Mechanical Drawing.....	4	Electricity	6
Biology	5	Trigonometry and Surveying..	4
Household Economics.....	6	Applied Mechanics and Steam..	4
Design	4	ELECT ONE GROUP.	
		Machine Shop Practice.....	6
		Machine or Architectural	
		Drawing	4
		Household Economics.....	6
		Design	4
		Stenography	5
		Typewriting	5

NOTE.—Singing and Physical Training (2) optional after first year.

CHICOPEE (MASS.) HIGH SCHOOL.

First Year.

English	4
Algebra	5
Elementary Science.....	4
Mechanical Drawing.....	4
Shop Work.....	12
Music (optional).....	1
Total number of periods, 30; required work.....	29

Second Year.

English	4
Plane Geometry.....	5
Mechanical Drawing.....	4
Shop Work.....	16
Music (optional).....	1
Total periods, 30; required work.....	29

Third Year.

English	4
Solid Geometry.....	4
Trigonometry	4
Mechanical Drawing.....	4
Shop Work.....	16
Applied Science (optional).....	4
Music (optional).....	1
Total periods, 34; required work.....	29

Fourth Year.

English	4
Industrial History.....	3
Shop Mathematics.....	2
Mechanical Drawing.....	4
Shop Work	20
Music (optional)	1
Total periods, 34; required work.....	33

MUSKEGON (MICH.) HIGH SCHOOL.*

Scientific Course

First Year.

English	5
Arithmetic	5
Phys. Geog. (1st T'm)	5
Physiology (2d T'm)	5
Manual Training.....	10

25

Second Year.

English	5
Algebra	5
Botany (1st Term)	5
Zoology (2d Term)	5
Manual Training.....	10

25

Third Year.

English	5
Plane Geometry.....	5
Latin	5
Manual Training.....	10

25

ELECTIVE.

French	5
German	5
Chemistry	5
Greek	5

Fourth Year.

English	5
Sol. Geom. (1st T'm)	5
Math. Rev. (2d T'm)	5
Latin	5
Manual Training.....	10

25

ELECTIVE.

French	5
German	5
Physics	5
Greek	5

Commercial Course

First Year.

English	5
Arithmetic	5
Phys. Geog. (1st T'm)	5
Physiology (2d T'm)	5
Manual Training.....	10

25

Second Year.

English	5
Algebra	5
Business Methods and Penmanship, including Elementary Typewriting.....	5
Manual Training.....	10

25

Third Year.

English	5
Bookkeeping and Penmanship..	5
Commercial Geography.....	5
Manual Training.....	10

25

ELECTIVE.

Stenography and Typewriting..	5
Geometry	5
French	5
German	5
Chemistry	5
Medieval History.....	5

Fourth Year.

English	5
Acct. and Business Practice....	5
Commercial Law and Banking..	5
Manual Training.....	10

25

ELECTIVE.

Stenography and Typewriting..	5
Physics	5
French	5
German	5
English History.....	5

Fifth Year

English	5
Trigon. and Math. Review.....	5
U. S. Hist. and Civ. Govt.....	5
Manual Training	10
	<hr/>
	25

ELECTIVE

French	5
German	5
Adv. Chemistry.....	5
Adv. Physics.....	5
Manual Training	5
English	5

Fifth Year

U. S. Hist. and Civ. Govt.....	5
Bus. Practice and Economics..	5
Manual Training	10
	<hr/>
	25

ELECTIVE

Stenography and Typewriting..	5
Chemistry	5
Physics	5
German	5
French	5

*NOTE.—Muskegon has a fine technical high school, given by the late Charles H. Hackley. The two courses printed show the way in which manual work of high grade is combined with academic work in a "Five Year High School," the eighth grade being combined with the high school.

SUGGESTED COURSES.*

Two systems of planning trade school courses may be illustrated by the following outlines:

PLAN No. I.

Special School, combining academic and trade training. Three years' course, boy to be 14 years of age on entering.

First Year.

English	}	
Mathematics		
Industrial History		
Drawing		
Current Events and Civics		
Physics		
Spelling		
		$17\frac{1}{2}$ hrs. a week, 40 weeks a year
		$17\frac{1}{2} \times 40 = 700.$
Printing	}	
Bookbinding or any other trades		
		$17\frac{1}{2}$ hrs. a week, 40 weeks a year
		$17\frac{1}{2} \times 40 = 700.$

Second Year.

English	}	
Mathematics		
Industrial History		
Drawing		
Current Events and Civics		
Physics		
Spelling		
		$17\frac{1}{2}$ hrs. a week, 40 weeks a year
		$17\frac{1}{2} \times 40 = 700.$
Printing	}	
Bookbinding or any other trades		
		$17\frac{1}{2}$ hrs. a week, 40 weeks a year
		$17\frac{1}{2} \times 40 = 700.$

Third Year.

English	}	17½ hrs. a week, 40 weeks a year $17\frac{1}{2} \times 40 = 700.$
Mathematics		
Industrial History		
Drawing		
Current Events and Civics		
Physics	}	17½ hrs. a week, 40 weeks a year $17\frac{1}{2} \times 40 = 700.$
Spelling		
Printing		
Bookbinding or any other trades	}	Total hours, 4200

PLAN No. II.

Special School; Preparatory and Trade School. The academic to be separate from trade training. Boy to be 14 years of age on entering Three years' course.

First Year.

English	}	6 hours a day 5 days=30 hours a week 30 hours $\times$ 40 weeks = 1200
Spelling		
Geography		
History		
Civics		
Mathematics		
Physics		
Drawing		
*Manual Training		

Second Year.

English	}	6 hours a day 5 days=30 hours a week 30 hours $\times$ 40 weeks = 1200
Spelling		
Geography		
History		
Civics		
Mathematics		
Physics		
Drawing		
*Manual Training		

Third Year.

Printing	}	48 hours a week
Bookbinding or any trades		$48 \text{ hours} \times 50 \text{ weeks} = 2400$
Trade training only		(same hours as shops)

Total hours, 4800

* Elements of trades.

*These courses are quoted by permission from an article by Mr. Samuel F. Hubbard, of Boston, in the *Apprenticeship Bulletin* for October, 1910. Mr. Hubbard argues strongly in favor of Plan II.

APPENDIX C—Authorities

1. Schools Visited.

The following schools have been visited either by individual members of the commission or by special sub-committees:

Agricultural High Schools.

Hillsdale, Mich.
Hudson, Mich.
Lawton, Mich.
North Adams, Mich.
Otsego, Mich.
St. Louis, Mich.
St. Anthony's Park, Minn.

County Agricultural Schools.

Menominee, Mich.
Marinette, Wis.
Menomonie, Wis.
Wausau, Wis.
Smith's Agricultural School, Northampton, Mass.

Manual Training and Industrial Schools.

Cincinnati (O.) Continuation School.
Chicopee (Mass.) High School.
Cleveland (O.) Technical High School.
Detroit Technical Institute.
Fitchburg (Mass.) High School.
Hackley Manual Training School, Muskegon.
Indianapolis (Ind.) Manual Training School.
Kalamazoo Manual Training School.
Mechanics Institute, Rochester, N. Y.
Newton (Mass.) Independent Industrial School.
Newton (Mass.) Technical High School.
North End Union School of Printing, Boston, Mass.
Ohio Mechanical Institute, Cincinnati, Ohio.
Rochester (N. Y.) Factory School.
Saginaw Manual Training School.
Saginaw Trade School.
Springfield (Mass.) Technical High School.
Winona Technical Institute, Indianapolis, Ind.
Worcester (Mass.) Trade School.

2. Bibliography.

Industrial Education.

Bulletin No. 2 of the Society for the Promotion of Industrial Education is a "Selected Bibliography on Industrial Education" (issued July, 1907). This and other bulletins of the Society may be purchased from the Secretary, No. 20 W. 44th St., New York City.

Dean's "The Worker and the State" (Century Co., 1910) contains an excellent bibliography, as does also the "Report of the Committee on the Place of Industries in Public Education" (N. E. A. 1910; copies may be obtained at 15c each, from Secretary Irwin Shepard, Winona, Minn.). The latter includes a considerable list of articles in periodicals, from 1902 to 1909. The brief list of books and articles here printed is suggestive only and given in order that readers of this report may have immediately at hand a working list of material quickly available.

The report just mentioned and "The Worker and the State" are two of the latest and most comprehensive discussions of the general subject, from the national point of view. Of value as showing the trend of discussion in the last ten years are the following:

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Chamberlain, A.: Standards in Education, N. Y. American Book Co.; 1908.

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Gillette, John M.: Vocational Education. American Book Co., New York; 1910.

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The report of the first or Douglas Commission has been republished by the Columbia University Press, N. Y.

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U. S. Department of Labor: Trade and Technical Education in the U. S. See U. S. Bureau of Labor Bulletin No. 53. Washington; 1904.

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Jones, Arthur J.: The Continuation School in the United States. U. S. Bureau of Education Bulletin No. 1, Washington; 1907.

Snowden, Albert A.: Industrial Improvement Schools of Württemberg. Published by Columbia University Press, New York; 1908.

Vanderlip, F. A.: Business and Education. N. Y., Duffield & Co.; 1907.

Recent periodical literature of value includes:

Reisner, E. H.: A Descriptive List of Trade and Industrial Schools in the United States. (Bulletin No. 11 of National Society for Promotion of Industrial Education.)

Elliott, E. C., and Prosser, C. A.: Legislation upon Industrial Education in the United States. (Bulletin No. 12, same society.)

Russell, James E.: The School and Industrial Life (Educational Review, December, 1909).

Davenport, Eugene: The Opportunity of the High School (Educational Review, November, 1910).

Washington, Booker T.: Chapters from My Experience (World's Work, October, November, and December, 1910).

Charlton, C. H.: The School at Interlaken (The Survey, Dec. 3, 1910).

Fuller description of some of the schools and plans cited in this report will be found in the following articles:

1. Rochester Factory School:

An "*Experiment in Industrial Education*," A. P. Fletcher.
"Elementary School Teacher" (pp. 9-14), September, 1910.

2. "Fitchburg Plan of Industrial Education," W. B. Hunter.

"School Review" (pp. 166-173), March, 1910.

3. Cincinnati Plan.

A. "*Partial Time Trade Schools*," H. Schneider.

"Annals of the American Academy of Political and Social Science" (50-55), January, 1909.

B. "*School System*."

I. "Annals of American Academy" (173-175), January, 1905.

II. "Good Housekeeping" (C. Reese), (pp. 610-615), May, 1910.

C. "*Continuation School*."

I. "Survey" (531-532), July, 1910.

II. "World Today" (1211-1212), J. R. Schmidt, November, 1909.

4. Milwaukee School of Trades.

"*Work of the School*," C. F. Perry.

"Annals of American Academy" (78-84), January, 1909.

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Bailey, Liberty H.: *Common Schools and Farming*. See his *Training of Farmers*. Century Co., New York; 1909.

Draper, Andrew S.: *Agriculture and Its Educational Needs*. See N. Y. State Education Department, *Fifth Annual Report*. Albany; 1909.

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Report of Commissioner of Education, 1908. *Agriculture and Industrial Training*. (Vol. I, p. 125.)

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