



LIBRARIES

UNIVERSITY OF WISCONSIN-MADISON

Report of the commissioner appointed by the legislature in 1899 to investigate and report upon the methods of procedure in this and other states and countries in giving instruction in manual training...

Harvey, Lorenzo Dow, 1848-1922

Madison, Wisconsin: Democrat Printing Company, State Printer, 1901

<https://digital.library.wisc.edu/1711.dl/ZXAGPZMGQ6CCL8M>

Based on date of publication, this material is presumed to be in the public domain.

For information on re-use, see

<http://digital.library.wisc.edu/1711.dl/Copyright>

The libraries provide public access to a wide range of material, including online exhibits, digitized collections, archival finding aids, our catalog, online articles, and a growing range of materials in many media.

When possible, we provide rights information in catalog records, finding aids, and other metadata that accompanies collections or items. However, it is always the user's obligation to evaluate copyright and rights issues in light of their own use.

REPORT

OF THE

COMMISSIONER

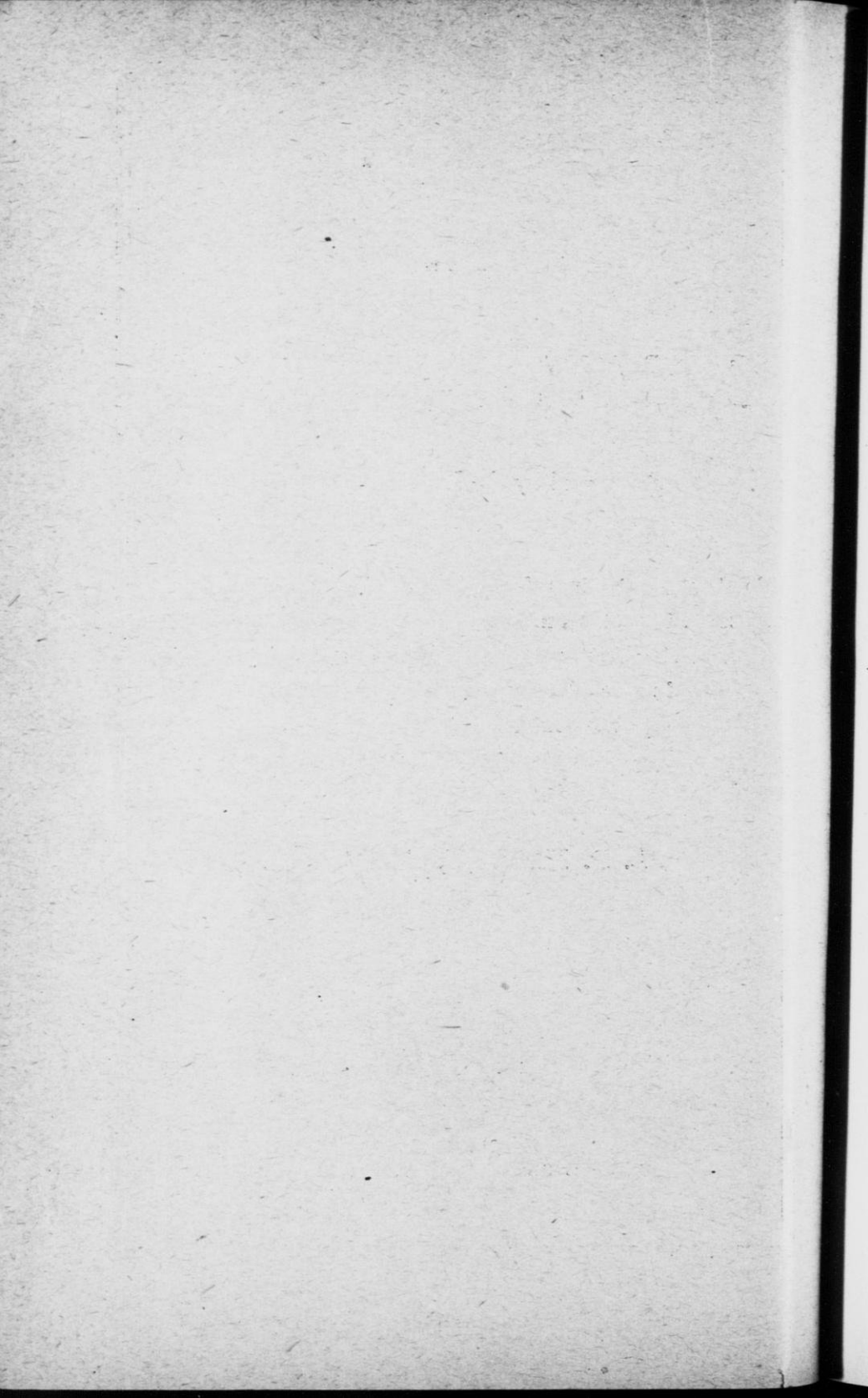
Appointed by the Legislature in 1899

To Investigate and Report upon the Methods of Procedure in this and Other States and Countries in Giving Instruction in Manual Training and in the Theory and Art of Agriculture in the Public Schools.

L. D. HARVEY, Commissioner.



MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1901



REPORT
OF THE
COMMISSIONER

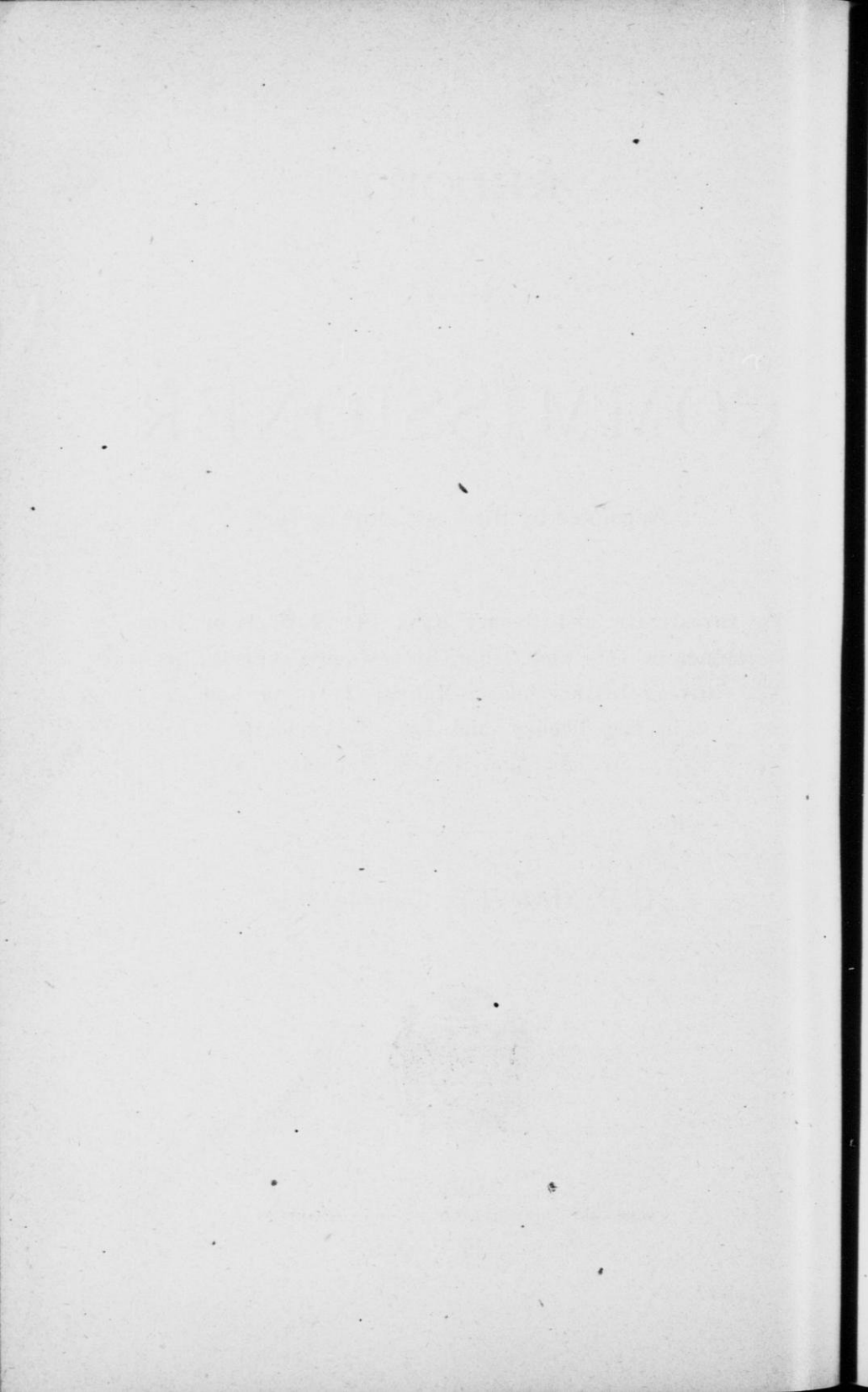
Appointed by the Legislature in 1899

To Investigate and Report upon the Methods of Procedure in this and Other States and Countries in Giving Instruction in Manual Training and in the Theory and Art of Agriculture in the Public Schools.

L. D. HARVEY, Commissioner.



MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1901



LETTER OF TRANSMITTAL.

MADISON, Wis., January 15, 1901.

To His Excellency, ROBERT M. LA FOLLETTE,
Governor of Wisconsin.

SIR:— I have the honor to submit herewith as required by Chapter 121, Laws of 1899, my report as Commissioner, appointed by the legislature "to investigate the methods of procedure in this and other states and countries in giving instruction in manual training and in the theory and art of agriculture in the public schools."

In the discharge of the duties imposed upon me by law, I have made an extended and careful study of what has been attempted in the fields of agricultural instruction and manual training in this and other countries.

Addresses on the subject of instruction in agriculture, its possibilities and advantages, have been given at farmers' institutes and other gatherings of farmers and others interested in the agricultural development of the state, in probably twenty counties.

Through the co-operation of the board of regents of normal schools, at my request, a plan has been inaugurated by which the seven institute conductors from the state normal schools have been assigned for work in twenty-eight of the agricultural counties of the state. Under this plan, each conductor will spend a week in each of four counties visiting the district schools each day, and addressing meetings of farmers each evening. In each of these addresses these men will present the desirability and advantages of instruction in the ele-

ments of agriculture and domestic economy for country boys and girls. Every effort will be made by the conductors, with the co-operation of the county superintendents, to awaken new and larger interest on the part of the people, in the education of the country boys and girls.

During the two years, I have made addresses in many of the cities of the state on the subject of manual training, and an extensive correspondence has been carried on for the purpose of arousing an interest in this subject; and in instruction in agriculture and domestic economy. As a result of these efforts, calls are coming for addresses upon these subjects from so many localities that my entire time could be devoted to this work.

Conferences have been had and correspondence carried on with recognized leaders in the field of agricultural instruction for the purpose of securing their judgments as to ways and means for inaugurating this work in the public schools.

With the hope that the efforts thus far put forth may not be without value, and that some provision may be made for further effort in the same direction, until tangible results are secured, this report is respectfully submitted, I am,

Very respectfully,
Your obedient servant,
L. D. HARVEY,
Commissioner.

REPORT ON INSTRUCTION IN AGRICULTURE IN THE PUBLIC SCHOOLS.

In reporting upon the feasibility of providing instruction in the Elements of Agriculture for rural communities, it is necessary first to consider whether such instruction is desirable. To determine this it is necessary to make a brief survey of existing conditions, both in the country and city.

I believe it will be conceded by all, that the purpose for which the public school system is organized and maintained, is the training for good citizenship. One of the first essentials of good citizenship is, that the individual shall be so trained as to be not only a self-supporting member of society, but so that he may be able to support those dependent upon him. An education which does not keep this end in view, is of but little value, and it is doubtful whether there can be any justification for support by public taxation of a system of education which ignores this element.

This does not mean that it is the function of the public school system to fit individuals for the immediate practice of whatever vocation they may decide to enter. While public interests may justify special lines of training for particular fields of activity, there must necessarily be a limit beyond which public education cannot wisely go in this direction. It is a recognized fact that the environment in which children are reared is, generally speaking, the one in which they are likely to continue in later years. We do not expect that the city-bred children, educated in city schools, will to any large extent find their future occupations in the country. And while it is true that there is a larger movement from the country to the city than from the city to the

country, it is still true that the majority of those reared upon the farm, will likely continue their activities in later life under conditions which obtain in the country.

I take it that it will be conceded that in the city schools an effort should be made to awaken an intelligent interest on the part of the children there being trained, in their immediate environment—not that their interests shall be confined wholly to the conditions of city life—but since they are likely to remain in the city, the necessity for the development of such an interest as will make the success of their life work more probable, seems evident.

The relations between country and city are becoming more close year by year, and it will therefore be clear that the city boy and girl will be more likely to succeed in the environment of the city, if they know something of and have some interest in the conditions which surround and control the activities of country life; but it will always remain true that their largest interests are concerned with the things immediately about them.

It is equally true that the education which the country boy and girl are to receive, should put them in touch with their environment, and should awaken an intelligent interest in the things immediately about them, and make clear to them the possibilities for intellectual activity and development for the individual who lives in the country. It should make clear to them the necessity for something more than hard physical labor for success upon the farm. It should make evident to them that a trained intelligence brought to bear upon the problems of farm life is a necessity for the highest success, and that when so brought to bear, if coupled with industry and economy, will produce financial returns coming to but a small proportion of those who find their life work in the cities.

If these premises are correct, then it follows, that the country boy and girl should have opportunities in the schools open to them and which they are able to attend, for securing a more intimate knowledge of the things with which they are likely to be concerned in after life, than is now afforded. They have a right not only to this knowledge, but to the kind of training necessarily re-

quired in securing it. It is important, to them also, that through this knowledge and training there shall come the development of a new set of interests, which under present conditions rarely exist.

To say that the country boys and girls, 98 per cent. of whom secure in the district schools all the education which they receive in any school, should be compelled to enter upon their life work with little or no knowledge of the myriad forms of plant and animal life about them, of the quality and composition of the soil from which they are to secure their livelihood, with no appreciation of the fact that successful agriculture demands the application of a wider range of scientific principles than any other vocation, with no knowledge of the facts and principles of science applicable to agriculture and with no interest in them, with no appreciation of the fact that modern industrial development with its improved means of transportation and communication, makes the problem of competition as vital a one for the farmer as for the merchant or the manufacturer, is to rob them of the very things which are essential to success in their life work, as measured not only from a financial standpoint, but from the standpoint of the development of the individual.

No one who knows anything of the teaching in the country schools, will contend, for a moment, that they are at present doing these things for their pupils. No one who knows the facts as to the age at which a majority of the pupils leave even the district schools to begin work, will claim that all that ought to be done for them can possibly be done under existing conditions in those schools. This is true, because the comprehension of the basic facts and scientific principles which it is necessary to know and apply in successful farming, cannot be secured at the early age at which most pupils leave these schools. Whatever might be done for them in the way of study of the things about them to quicken their intelligence and awaken their interests, is done to-day in very few schools. The only opportunity afforded the country boy in Wisconsin to secure any working knowledge of the scientific basis of agriculture, is that given in the agricultural department of the State University. That department is doing a

grand work, not only for the development of the young men who attend it, but for the material development of the entire state. At the present time, crowded as it is beyond its capacity to adequately care for those who are in attendance, less than five hundred boys from our rural population are securing its advantages. These boys when they go back to the communities from which they came and put into practice what they have learned at the University, show the beneficial results of the kind of training given there. Their influence affects others, and is ever widening. That influence would extend much more rapidly, and improvement in modes of farming would make more rapid strides, if opportunities were afforded for awakening the interest and intelligence of the boys in every farming community in the state, in matters which vitally concern the people of these communities. The high schools which exist in the cities and villages offer but few opportunities for the country boy and girl to secure the kind of training which would be most valuable for them if they are to remain upon the farm. They will get in these schools a general training, such as comes from the study of books, but the farmer has to deal not with books alone, but chiefly with things, and the high school does not effectively train its pupils for this form of activity. It becomes evident then, that it is desirable to modify in some considerable degree the work now done in the district schools, by offering in them instruction in the study of nature, or in other words, through training which will develop the power and the habit of close observation of the things about them, an interest in whatever pertains to rural life, and a tendency to look for the reasons for things. Whatever can be done with pupils of the age of those found in the district schools to cultivate a taste for the study of nature in its various forms, should be done. This should be supplemented by a class of schools to be established in farming communities, which shall undertake to carry on this work beyond the district schools, where it may be easily accessible to the country pupils, and at low cost.

For this modification of work in the district schools, but little can be hoped under existing conditions. It

has been attempted in our own state and in other states and countries, and in every case has proven a dismal failure, except where teachers have been specially trained to do this kind of work. Our Wisconsin teachers do not have this training at the present time. The normal schools are doing something in this direction, but may and ought to do much more. □ But even then, the results would be meagre in the great mass of the district schools, for most of these schools are taught by teachers who have not had the advantages of normal school training. The teachers' institutes have for two years been undertaking to awaken an interest in this work, and, so far as possible, have offered instruction during the brief time they have been held, which should aid the teachers in carrying it on. Were the funds for these institutes adequate to furnish the full quota of institute work called for from the several counties of the state, much more might be done than it is possible to do at the present time. Even then, the constant change in the teaching force, by which probably not less than two thousand new teachers enter the public schools each year who have not been specially trained, it would be impossible to carry on the work continuously and effectively in a large number of schools. Even under the best conditions possible of realization the extent to which this work may be successfully carried on in the district schools is necessarily limited. If communities would take advantage of the possibilities growing out of the consolidation of schools and transportation of pupils at public expense, by which the children of the entire township could be brought into one central school without any increase of expenditure, it would be possible to secure teachers trained for this work, more regular attendance, and therefore, better results. Even then much would remain to be done. The class of schools I have already suggested, which should offer in each agricultural county an opportunity for the pupils after completing the district schools to carry on this work nearer their own homes, where they can attend without any large expense, is needed, if our public school system is to adequately do the work of training for citizenship demanded by modern conditions.

Elementary and secondary instruction in agriculture is something comparatively unknown in this country. To show that it is not an untried experiment, and to give an idea of what is being accomplished elsewhere, the following statement of what is being done in foreign countries is presented.

Acknowledgments are made to Prof. F. W. Woll, Assistant Professor of Agricultural Chemistry, University of Wisconsin, and to A. C. True, Ph. D., Director of the Office of Experiment Stations, U.S. Department of Agriculture, for valuable information concerning the status of Agricultural Education in the Scandinavian countries, Finland, and Belgium.

DEVELOPMENT OF AGRICULTURAL INSTRUCTION IN OTHER COUNTRIES.

THE SCANDINAVIAN COUNTRIES.

Norway, with a population of two million, had in 1896 forty-two institutions for agricultural instruction, research, or control. Sweden, with a population of less than five million, had eighty-six such institutions. Denmark, with a population of less than two and a quarter millions, and an area of 15,289 square miles, has twenty-eight such institutions. Finland, with a population of less than two and a half millions, and an area of 144,255 square miles, had 49 such institutions. These institutions in the four countries, were classified as follows:

Agricultural colleges	5
Agricultural intermediate schools	2
Agricultural elementary schools	87
Dairy schools	46
Horticultural schools	10
Forestry schools	5
Farriery schools	4
Chemical control stations	11
Milk control stations	3
Seed control stations	25
Experiment stations	7

The four countries have on an average, an agricultural school for about every 58,000 of the rural population, and a control or experiment station for every 220,000

of the rural population. In order to reach a similar ratio in Wisconsin, there would have to be thirty-four agricultural schools, and nine experiment stations.

The institutions for furnishing instruction in agriculture in the Scandinavian countries are of two classes, those designed to give elementary instruction, and those for advanced instruction. The schools offering elementary instruction in agriculture are located in different parts of each of the countries, and are supported largely, though seldom wholly, by state aid, the districts in which the schools are located paying the remaining portion of the expense. In Norway the state pays on an average three-fourths of the expenses for the support of these elementary schools, while in the other Scandinavian countries the appropriations are of definite sums. In all these countries the institutions offering the advanced instruction in agricultural branches are supported wholly by the respective states. The difference between these two classes of schools may be briefly stated as follows: The elementary schools provide both practical and theoretical instruction, except in one class of Swedish schools, while the higher agricultural schools are essentially theoretical, previous experience in ordinary farm work being required of students.

As the state university already provides facilities for advanced work, it will be unnecessary to consider, in this report, the plan of organization and character of work in the higher institutions.

In each of the four countries named, the elementary agricultural schools have practically the same basis of organization. In all of them the instruction given is built upon the common school education. The aim as stated is "to impart fundamental knowledge in agricultural branches to future farmers." To be admitted as a pupil in most of these schools, the candidate must be eighteen years of age, must produce a doctor's certificate that he is strong, without bodily defects, and free from contagious disease. He must also present a certificate of character from his pastor. He must be able to write with a fair degree of correctness, from dictation, be efficient in the elementary work in arithmetic, and have a fair knowledge of the geography and history

of his country. At least one year's practice in ordinary farm work is required as an essential for admission, and an application, written by the candidate himself, must be sent to the director of the school. The candidates must finally pass an entrance examination in composition, arithmetic, geography, and history, before being admitted as pupils. Preference is given to applicants living in the district where the school is located, and to eldest sons having allodial rights, who therefore may be counted on settling as farmers in the district. The number of applicants for entrance to these schools greatly exceed the number that can be accommodated, so that only those who are well qualified for the work, and who intend to become farmers in the district in which the school is located, are, as a rule, likely to be admitted.

The schools are located in the country on farms belonging to the respective districts (counties), and operated at their expense supplemented by state aid.

The farms vary in size from one hundred to two hundred acres, or more. They are generally well equipped with buildings, farm machinery, library, instructional apparatus, improved stock, etc. The director must be a practical farmer. He usually holds a diploma from one of the agricultural colleges, and often he has continued his studies abroad, along special lines, after graduation. It is required of him to conduct the farm so that it forms a good object lesson and a model, both for the pupils themselves and for the farmers in the surrounding district. The number of teachers at these schools in addition to the director, varies somewhat, according to the development and conditions of agriculture in the various districts. There is generally a second teacher, who is the assistant to the director, and also teachers in horticulture, forestry, and dairying. The latter are experts in their particular lines, and teach only these branches, while the general fundamental branches are taught by the director and his assistant. The course of instruction offered in these schools, is partly theoretical and partly practical, and lasts from one and a half to two years. The practical instruction occupies three hours a day, and covers the following preparatory studies: Composition, practical arithmetic,

plane geometry, chemistry and physics. The basal studies taught are agriculture (including mineralogy, geology, botany, and physiology), animal husbandry (including dairying), forestry, horticulture, book-keeping, and farm accounts. Practical exercises are given in surveying, map drawing, farm machinery, and farm buildings, drainage, forestry, horticulture, blacksmithing, and carpentry, and geological and botanical excursions. Practical work in the field or barn occupies the full time of the students during the summer, when they take part in the regular farm work under the supervision of the director or the second teacher. Work in blacksmithing and carpentry comes throughout the year, by rotation, one or two students at a time having exercises in these branches each day, or afternoon. The class room instruction consists largely of recitations from text books, and written compositions on the subjects treated are frequently required. At the completion of the full course, the students are subjected to written and verbal examinations, the former in agriculture, animal husbandry, and practical arithmetic, the latter in agriculture and botany, animal husbandry, forestry and horticulture, chemistry and physics, practical arithmetic and geometry. The pupil is marked in each study, and on passing the examination and properly completing the course, receives a diploma from the school, giving in detail his standing in each study, and his average standing, together with the remarks on his industry and behavior during his school life.

SWEDEN.

In Sweden there is a second class of elementary agricultural schools, which are calculated to furnish young men with the theoretical education required for the proper management of the smaller farms. The courses last twenty to twenty-four weeks, beginning on the last week day of October each year. The requirements for admission are somewhat higher than those just stated, and in addition at least one year's experience in ordinary farm work is required. The studies taught in this school are physics and meteorology, chemistry, botany, zoology, geology, agriculture, veterinary science, animal

husbandry, dairying, architecture, geometry and surveying, farm book-keeping, and drawing. The total number of hours of instruction during the course varies from 595 to 1,001 at the different schools, or an average of four to seven hours a day. For all the schools of this class the average number of hours of instruction in a given year is 825, equivalent to six hours daily. The state pays one-half the expense of maintaining these schools, the other half being borne by the county in which the school is located. The plan of instruction is under the control of the state. There are at present fourteen agricultural schools of this class in operation in Sweden.

DENMARK.

Denmark has seventeen elementary agricultural schools, all supported in part by the state. The growth of interest in agricultural instruction in Denmark during the latter half of the century as compared with the lack of interest during the earlier part of the century, is shown by the fact that the first school of this kind was opened in Denmark in the year 1800. This, so far as is known, was the first agricultural school ever organized in the world. The school was founded through the generosity of a Danish Major General, J. F. Classen. His will contained the clause providing for the establishment of a seminary or agricultural institute for the benefit of "good subjects of the farming class" where fundamental agricultural principles were to be taught during a course of from three to four years. The scholars were to have free rooms and board, and also necessary wearing apparel. They were to be elected from the different parts of the country on recommendation of the county magistrates. The agricultural society was asked to select a person who should fit himself for the professorship of agriculture in this school through three years of travel in foreign countries. In 1793 a Mr. Olufsen was elected to the position, and he traveled through most of the European countries during the following years. On his return to Denmark, he at once proceeded in conjunction with the board of regents of the school and the state agricultural society, to carefully plan, build, and equip the school at Nasgaard, located in a beautiful re-

gion peculiarly well adapted for the purpose in view. Only one pupil presented himself, however, and the opening of the school was postponed. "The farmers did not believe that anything could be gained by going to a school to learn how to run a farm." The school was not opened permanently until 1849, nearly fifty years having elapsed before sufficient interest in the subject had been aroused in Denmark to furnish enough students to warrant the opening of the school. Since that time the school has been in operation, and at the present time twenty-five educational institutions, devoted to instruction in agriculture, and three stations are being carried on. It is stated that in these schools the number of young farmers who have received instruction considerably exceeds ten thousand. This is a remarkable showing considering the fact that the total population of the country is a little more than two million people.

FINLAND.

Finland has two so-called intermediate agricultural schools of a somewhat higher grade than those already described. In these schools two different courses in agriculture are offered, one lasting two years, and the other one year. A dairy course is also given. The instruction offered is both theoretical and practical. The following number of hours are given to the various studies in the two years' course:

First year—Natural history, 122; arithmetic, 153; composition, 259; total, 534.

Second year—Natural history, 30; arithmetic, 86; composition, 57; agriculture, 134; animal husbandry, 50; veterinary science, 65; farriering, 9; drawing, 40; forestry, 30; surveying, 65; agricultural law, 18; farm book-keeping, 76; total, 660. In addition the students take part in all practical work on the farm, in the field, barn, and stable, composting manure, threshing, tile draining, grubbing, gardening, harvesting ice, road repairing, forestry work, etc. The students are in general graduates of the Finnish common schools or high schools. In one of the two intermediate agricultural schools, a theoretical winter course running through two sessions is required. The plan of instruction given

is more along theoretical lines, and is more advanced than that followed in the elementary agricultural schools.

There are twenty-two elementary agricultural schools in operation in Finland. The state assists in the maintenance of each of these schools. Even with this number of schools organized, the facilities are not yet ample to provide instruction for all seeking it.

A comparison of the courses offered in these schools with the short courses offered in the agricultural department of our state university, shows that in many respects the work is similar. In those countries many of the students in the higher agricultural schools have had their preliminary training in these elementary schools of agriculture.

AGRICULTURAL INSTRUCTION IN IRELAND.

From the report of the Parliamentary Commission on Manual and Practical Instruction in Primary Schools in Ireland, submitted to parliament in 1898, it appears that the commissioners of national education for Ireland, in their report for 1837, expressed an intention of providing for instruction in those branches of science which have a practical application of husbandry and handicraft. The Commission found, however, at the time of its report, that the branches of science "having a practical application to husbandry do not hold so prominent a place in the school curriculum as the report of 1837 would lead them to expect, while practical farming, so far at least as such a subject could be taught from the text book, is one of the chief branches of instruction." Under the rules of the commissioners of national education, agriculture is a compulsory subject for boys of the fourth and higher classes in all rural schools, and is optional for girls. Even in town schools, the subject may be taught to boys and girls. In 1896 the number of pupils examined in this subject was 85,773, of which 56,478 passed. The amount of government aid given directly for this work, was about \$65,000 in that year. The following is taken from the report of the commission:

"The program laid down by the Commissioners of National Education consists of various chapters of a

text book entitled 'Introduction to practical farming,' which deals with such subjects as the following: Cultivation of land; manures; live stock; dairying; gardening; agricultural instruments; land drainage and reclamation; farm fences; etc. The subject was taught in the national schools as a rule entirely from this text book, and was unaccompanied by any practical illustrations, a knowledge of the text book alone being required by the rules of the commissioners."

"The evidence we have received throughout Ireland goes to show that the subject so taught is of little educational value. The children do not get any real grasp of the subject, as no efforts need be made to give them a practical acquaintance with the objects and processes described in the lessons. For example, Dr. T. J. Alexander, Head Inspector of National Schools in Cork, states that the present book teaching is worthless. Mr. Purser, another Head Inspector, expresses the same opinion. Lord Monteaagle, who is much interested in agricultural education, is of opinion that the present teaching out of a book is wholly useless if not worse. Similar evidence was given by many other competent witnesses. This opinion is quite in accordance with the evidence we received in England. Mr. John Chalmers, Head Master of Burton School, Westmoreland, stated that he would not think anything of the teaching of agriculture merely out of books. Another witness, Mr. C. Courtenay Hodgson, Organizing Secretary to the Cumberland County Council, was of the opinion that theoretical instruction without work by the pupils on an experimental plot, was quite valueless. Mr. T. G. Rooper, one of Her Majesty's Inspectors of Schools in England, declared that he would never encourage the teaching of agriculture merely from books." The following are some of the recommendations of the commission:

"We are strongly of opinion that even if the instruction were more efficiently given, the subject of practical farming forms no fitting part of the program of a primary school. The attempt to teach the details of the art of agriculture to children of school age can be of little profit. As regards the scientific aspect of agriculture on the other hand, some preliminary train-

ing in the simplest elements of natural and physical science is absolutely necessary for a proper appreciation of the bearing of scientific principles to the practice of farming. While, therefore, we fully recognize the great importance, especially as regards Ireland, of instruction in practical farming, we consider that this should be given only in special schools of a technical character."

"We are consequently of opinion that the course in agriculture at present prescribed for national schools should be altered. The new course should consist of instruction in the elements of the natural and physical sciences that have a direct bearing on agriculture, and this instruction should be given with the aid of experiments of a simple character, performed as far as possible by the pupils themselves. Such a course of instruction will be of a nature entirely within the capacity of the children of a primary school. It will afford a good disciplinary training for all children, even for those who are not to be subsequently engaged in the practice of agriculture, while it will enable those who are to be so engaged at a later stage, to make intelligent use of scientific treatises on the subject."

The course in agriculture thus modified, will naturally constitute the course in elementary science for boys in rural schools.

"In this connection we beg to call attention to the following extract from a publication recently issued by the French government on the 'Teaching of Elementary Ideas of Agriculture in Rural Schools,' which clearly expresses our views on the matter:"

"Instruction in the elementary principles of agriculture, such as can be properly included in the programme of primary schools, ought to be addressed less to the memory than to the intelligence of the children. It should be based on observation of the every-day facts of rural life, and on a system of simple experiments, appropriate to the resources of the school, and calculated to bring out clearly the fundamental scientific principles underlying the most important agricultural operations. Above all, the pupils of a rural school should be taught the reasons for these operations, and the explanations for the phenomena which accompany them, but *not* the details of methods of execution, still less a *resume* of maxims, definitions or agricultural precepts. To know the essential conditions of the growth of cultivated plants, to understand the reasons for the work of ordinary cultivation, and for the rules of health for man and domestic animals—such are matters which should first be taught to everyone who is to live by tilling the soil; and this can be done only by the experimental method.

"The master whose teaching of agriculture consists only in making the

pupils study and repeat an agricultural manual, is on the wrong path, however well designed the manual may be. It is necessary to rely on very simple experiments, and especially on observation.

"As a matter of fact, it is only by putting before the children's eyes the phenomena to be observed, that they can be taught to observe, and that the principles which underlie the science of modern agriculture, can be instilled into their minds. It should be remembered that this can be done for the rural agriculturist only at school, where it will never be necessary to teach him the details which his father knows better than the teacher, and which he will be certain to learn from his own practical experience.

"The work of the elementary school should be confined to preparing the child for an intelligent apprenticeship to the trade by which he is to live, to giving him a taste for his future occupation; with this in view, the teacher should never forget that the best way to make a workman like his work, is to make him understand it."

In Ireland there were in '98, forty-seven national schools having farms attached, varying in area from one and a half to forty-eight acres, in which instruction was given not only in the theory but in the art of practical agriculture. These farms are technically known as school farms. There were also eighty-two national schools having gardens attached, usually less than one acre in extent, in which instruction was given in cottage gardening, poultry management, etc. These are known as school gardens. The Commission recommended that in order to give teachers facilities for experimental teaching, school gardens, each of which need not contain more than one-quarter of an acre, should be provided where possible in connection with rural schools. They state: "These gardens if well and tastefully kept, would have a refining and elevating influence on the children, and would thus indirectly tend to improve the surroundings of their own homes. Even where land is not available for school gardens, the teacher should endeavor by simple experiments in the school room, to illustrate natural processes, such as the germination of seeds, the effect of manures, etc., and should utilize any opportunity afforded by the locality to exemplify the practical applications of scientific principles."

ELEMENTARY AGRICULTURAL INSTRUCTION IN FRANCE.

In 1887 a decree was issued by the French government, making provision for instruction in the elements of agriculture in the primary schools in France. The scheme was somewhat like that outlined for Irish schools, namely, a series of lessons from a text book

dealing with methods of cultivation of the important crops, gardening, and a few notions about the care of live stock, soils, manures, drainage and common agricultural instruments. In France as in Ireland this scheme proved unsatisfactory, and in about 1897 the plan was abandoned and a new scheme inaugurated. The new scheme limits agricultural teaching in elementary schools to giving the pupils instruction in scientific notions that underlie the principles and practices of agriculture, with reference to conditions under which the crops grown are best developed, the reasons for the principal operations of cultivation, and the laws of growth of man and the domestic animals. These notions are to be taught by means of object lessons, and by experiments. Actual methods of cultivation are not to be taught, because (1) the children of country schools (who seldom frequent the school after twelve years of age) are too young to learn them, and (2), the teachers can not be expected to be complete masters of the art and practice of agriculture. It is desired that all scientific teaching in country schools should have an agricultural bearing, and that it should as far as possible be accompanied by experiments on the part of the teacher from the very first. In this plan, the nature of these experiments is two-fold: 1. Physical experiments illustrating elementary scientific notions such as the three states of matter, properties (e. g., density, volume) of air, nature of oxygen, nitrogen, and carbonic acid gas, effect of these gases on life and vegetation, force of gravity, a few of the commoner phenomena produced by heat and light (e. g., combustion, expansion, reflection, etc.); germination of plants, and their economy."

2. "Experiments by cultivation in flower pots or in assigned portion of school garden. These experiments have for objects the demonstration of the different growth of plants according to their conditions as regards manures, modes of tillage, etc. The first kind of experiments is generally carried on during the winter months, the others in the spring and summer. Pupils of the intermediate and higher classes assist at and take part in them."

In connection with the French rural schools there are school gardens, and experimental plots. The

school garden is the private property of the teacher, and used by him for his sole profit and advantage. If it is used in teaching agriculture, it is because it happens to be the most convenient place for that purpose. The experimental plot is on the contrary, public property, and is used for demonstrating some important fact in plant growth or for making some interesting experiments useful either to children or adults.

While nearly every rural school has a school garden, not four per cent. of them have an experimental plot, and yet it is fully recognized by the leading authorities that until every school has such a plot, much lower scientific teaching on the value and correct use of manure, and on the selection of the best varieties of the different crops grown in the locality can not be expected. What stands most in the way of obtaining these plots is the fact that the rural communes who have to pay the rent for them, not rightly appreciating their utility, do not care to incur the expense, but an effort is being made to point out the necessity of supplying them. These plots are usually small in extent, generally not exceeding a quarter of an acre. The foregoing relates to work in what is known as the primary schools of France, corresponding to our district schools.

The next higher class of schools is called the higher primary. I give here the program of theoretical agriculture and horticulture in this class of schools. These schools are adapted to pupils from thirteen to sixteen years of age, who have completed the work in the primary schools.

AGRICULTURE.

First Year.—Soil—Sub-soil.—Modifications in view of cultivation, instruments of tillage, different operations of cultivation.

Study of plants from an agricultural point of view. Natural agents of vegetation.

Domestic Animals.—Useful and injurious insects.

Garden Instruments.—Principal operations of horticulture.

Second and Third Year.—Soil and water, drainage and irrigation.

Operation and instruments of large cultivation.

Cultivation peculiar to the district.

Natural and artificial meadows.—Vine growth.

Large and small cattle, poultry-yard, rearing of bees.

Gardening.—Vegetable and fruit gardens, works and products.

Notions of the growing of trees.

Agricultural economy.

Agricultural bookkeeping.

PRACTICAL AGRICULTURE AND HORTICULTURE.

First Year.—The pupils are employed as helpers in the work of the other years.

Second and Third Years.—*Spring and Summer Work.*—Principal operations of gardening, demonstrative cultivation, grafting, comparative experiments in cultivations; plants of different varieties with the same manure, same plants with different manure, experimental squares and plots. Cultivations peculiar to the region.

Winter Work.—Preparation of products used in agriculture; lime in its different forms, salts of copper, etc.; mixing lime and sulphur with seed corn, etc.; experimental study of the elements of a piece of earth, of vegetable mould, of a cinder, and of the principal manures (these experiments will be simply qualitative.)

Work has been begun looking toward the preparation of teachers for the carrying out of these experiments through the introduction of the system into the eighty-five male training colleges in France where opportunities are offered for teachers to prepare themselves for this work. Teachers have also been invited to discuss the subject in all the teachers' conferences held for discussion of methods of teaching.

The former able Director General of French Agriculture, Monsieur Tiesserand, says, "the aim and object of France has been not only to give to children and young people, the means of acquiring knowledge, but also to establish means for *interesting old cultivators*. In this century of extreme competition we must admit that the agriculturist can only thrive if, in working the soil, he adopts scientific methods. Old routine is no longer sufficient in this branch, as it is proved to be insufficient in manufacture."

From statistics of 1893, it appears that during that year instruction was given in France to 3,600 pupil teachers, thirty agricultural laboratories throughout the country furnished analyses of soils and manures, for the help of cultivators, and 3,362 trial farms were established, where farmers could profit by experiment suitable to their own districts. At that time the special farm schools numbered 16; practical schools of agriculture, 39; national schools of agriculture and horticulture, 6; three veterinary schools, and one each bearing the name of National Agronomic Institute, is a Shepherd school, a Cheese, and a Silkworm school. In the universities there were 160 departments and chairs

of agriculture for students of profoundest research. All this cost the department alone over 4,504,050 francs per annum.

AGRICULTURAL INSTRUCTION IN SWITZERLAND.

No work in this subject is done in the primary schools of Switzerland. There is, however, a class of secondary rural schools to which pupils go after completing the work of the primary school, and where special attention is given to the teaching of agriculture. The program of studies in this class of schools for boys is as follows:

- (1) French.
- (2) German.
- (3) Arithmetic.
- (4) Geometry.
- (5) Physical natural science.
- (6) Geography and history.
- (7) Drawing.
- (8) Special courses of agriculture and manual work.
- (9) Gymnastics, and
- (10) Singing.

That for girls is the same, except that we find domestic economy, cutting out, dress making, and ironing, in place of agriculture and gymnastics. These courses last from nineteen to twenty-two hours a week, those for the boys being held in the morning from 7 to 11:30 or 12, and those for the girls from 1 to 5 or 5:30 P. M. These schools are built and furnished by two or more communes united for the purpose. The canton pays the teachers and the special professors, and supplies the materials necessary for the daily work of the pupils.

In these schools the subject of agriculture is divided into the following parts, each of which is taught by a specialist in the subject, who, however, does not confine his work to one school, but who goes round from one to another of the schools in his canton. His visits are determined at the beginning of the year by the educational department of the state, and the days on which he is to visit that particular school are set forth on a printed time table, which is sent to each of the schools

at the beginning of the year. The following are the subjects taught, programs prescribed, and number of lessons per annum.

1. *Arboriculture*.—Choice of the best varieties of fruit to cultivate. Plantation of trees, and care to be given to the orchard. Different kinds of grafting; budding, pruning, and training (10 lessons).

2. *Market Gardening*.—Cultivation of the principal vegetables and choice of the most remunerative varieties. Growth of beans, both haricot and French. The cultivation of the strawberry plant; choice of the best varieties for transportation and for the market. The Tomato. Rhubarb. Potatoes, quick, early, etc. Garden Practice. Sowing; planting of vegetables (6 lessons).

3. *Vine Culture*.—Unnecessary to give details.

4. *Rearing of Cattle*.—Improvement of the race of domestic animals. Rearing; Feeding. Study of the "points" of horned cattle as to the indications they give of the value of these cattle (with practical demonstrations). First care to be given to domestic animals in case of sickness (with practical demonstrations, 5 lessons).

5. *Rearing of Bees*.—Conditions essential for a good wintering. Work to be done during the winter. First visit of the year; the most favorable moment. Series of work to be done up to and at the time of collecting the honey. Practical exercises (4 lessons).

These courses are not only for the pupils of the secondary rural schools, but also for young persons of both sexes of more than 15 years of age who have completed the sixth course of the primary school.

To enable the program to be usefully carried out there is attached to each of these schools an experimental plot. These plots are usually small, but the pupils are allowed to work in the school garden also, and have thus a fairly wide scope for experiments and observation. In the school garden they can also see the result of experiments undertaken in previous years by their predecessors. The following is from the report of a visitor to one of these schools: "At Bernex I saw in operation an interesting and useful practice. Each pupil when he goes to school is allowed to plant 10 or 12 young fruit trees of different kinds, and to graft others if necessary. These they watch and attend for the two years they remain at the school; when leaving the school they are allowed to dig them up and bring them home and plant them in their father's garden. In this way the Genevese, who are at present giving much attention to the improvement of fruit trees, hope after a short time to spread both good trees and the knowledge of the right way of caring for them throughout the country. The head master informed me that the boys take special interest in the result of their own labours, and are quite proud when they have been successful in grafting a plant or in any other operation, with the result that even those otherwise indifferent about their work begin to bestir themselves, not only at practical work, but also at their other studies.

* * * The education given in these schools is well calculated to open the minds of the peasant and the farmer to everything that could interest them in their daily life, making them see beauty where otherwise they might see nothing; training them while still young to perform the daily labours of rural life with interest and intelligence, and thus begetting in them a love for country life, which bodes well for the future prosperity of their native land. What we have to recognize is that the town, with all its attractive appearance and outward show, is daily drawing, in every country in Europe, the peasant from the field, the cultivator from the farm, and is in so far diminishing the native production of the country by draining it of its workers. How to stop this drain is, in France and Switzerland as well as here, the question of the hour; and have we

not in these rural schools the best solution of the question yet offered? These schools are for the many, not for the few; for the young, not for the old; and they are to be found within easy reach (2½ miles in Geneva) of every pupil, and thus satisfy all reasonable requirements."

AGRICULTURAL INSTRUCTION IN BELGIUM.

The teaching of agriculture has been obligatory in rural schools in Belgium for the last fifteen years. For the town schools a program in Notions of Natural Science has been drawn up to correspond to the agricultural teaching in the country, but it is not obligatory. As a rule, however, most city schools have the subject in their course, and the number of boys' schools that teach neither science nor agriculture is small.

The system of agricultural education adopted in Belgium in 1890 provided for primary, secondary, and superior schools or courses of agriculture. Primary agricultural courses for adult farmers are conducted under the direction of the master of agriculture, while courses of a similar grade for teachers and children are supervised by the minister of public education. The secondary and superior schools of agriculture, as well as other agencies for promoting agricultural education and research, are directed by the minister of agriculture. To provide competent teachers for carrying on this work in the primary schools, the course of the normal schools has been organized so as to give regular attention to agriculture, and in order that the teachers already in the primary schools may be fitted to conduct the newly established courses of agriculture, special normal schools on these subjects are provided, during the vacation season. Agriculture in the primary schools consists of two lessons a week which are given in accordance with a plan outlined by the government, and financial and other encouragement is given to those teachers who excel in such instruction. Thus far there has been considerable difficulty in securing teachers having the right equipment of knowledge and teaching ability for this kind of work. For this reason the success of these primary courses of agricultural instruction has been quite varied in the different places, and the matter can hardly be said to have passed beyond the experimental stage. Three of the secondary schools of agriculture are already organized. One of these is devoted entirely to agriculture, while two give instruction both in agriculture and horticulture. The oldest of these insti-

tutions is the one at Ghent, having been founded in 1855. It is thoroughly equipped with facilities for practical and theoretical instruction. Candidates for admission must ordinarily be at least sixteen years old, and pass an examination in the French or Flemish language, natural history, geography, and arithmetic. They must also give satisfactory proof that they are physically able to regularly carry on the practical work required in connection with their studies. The regular course occupies three years, and includes instruction in French, Flemish, German, and English languages, arithmetic, book-keeping, geometry, geography, botany, elementary physics, and chemistry, drawing, agriculture, engineering, animal physiology, and production, and the theory and practice of agriculture and horticulture. Special attention is given to horticulture, which is a very important industry in Ghent, as well as elsewhere in Belgium. In schools of this grade the effort is made to train young men for the practical pursuit of agriculture or horticulture on a relatively large scale. It is expected that they will become managers of estates or foremen in horticultural establishments.

Secondary instruction in agriculture and horticulture is also provided for in a number of private schools, which are organized with reference to instruction in these lines in return for small subsidies. Twenty of these private schools of agriculture are now in operation in Belgium, and are so located as to meet the needs of the different agricultural regions. Provision is also made by the government for short courses in agriculture in public and private secondary schools for general education. These courses consist of at least one lesson a week during the school year, which must be given in accordance with the plan laid down by the government. Thirty schools in Belgium are at present giving such courses. This plan has the advantage of providing at least an outline of the theory and practice of agriculture at small expense to a considerable number of students, who are at the same time, acquiring an ordinary high school education. Such a course awakens their interest in the more scientific and advanced ideas regarding agriculture, and prepares them to read with intelligence the reports of agricultural in-

vestigations. It also tends to make them more contented with rural life. A school for the theoretical and practical instruction of young women in agriculture, including dairying, kitchen gardening, domestic economy, etc., has been established in each of the provinces of Belgium.

LECTURE COURSES FOR ADULT FARMERS.

To meet the needs of adult farmers who can not attend schools, numerous lecture courses on agricultural topics have been organized. Each year some 250 courses of 15 lectures each on questions of general interest to farmers are given in the different rural districts of Belgium by graduates of the higher agricultural schools or other persons who are thoroughly competent for this kind of work. In an article on agricultural education in Belgium published in 1893, M. DeVuyst, an officer of the Belgium Government whose duty it was to supervise these courses, thus writes regarding them:

"To secure practice in this exceedingly difficult kind of teaching, the persons to give these courses meet together twice a year in each district. At these meetings one of their number presents a typical lecture and the others discuss it. The best lessons in the different courses are printed and distributed. At these meetings the improvements which are most urgently needed by the farmers of the region are also studied.

"This method of organized courses of instruction in agriculture for adults is, we believe, peculiar to Belgium. The results it has produced during four years are quite important. There are in the Kingdom about 2,500 rural communes. Within a few years no locality will have reason to complain it has not enjoyed the advantages of this institution. The courses are attended each year by more than 10,000 farmers. The expense of conducting them amounts to only about \$1 per hearer."

Besides these general courses in agriculture, special courses in orchard management, market gardening, dairying, animal husbandry, horseshoeing, apiculture, etc., are also given, and farmers' meetings of one or two days' duration, corresponding somewhat to our farmers' institutes, are held in different places under the supervision of government officials. In each of the provinces there is a state agriculturist and an assistant agriculturist, whose business it is to hold farmers' meetings, deliver lectures, establish fields of demonstration in which the results of agricultural investigations may be

shown on a practical scale, aid the agricultural societies in their work, collect agricultural statistics, and prepare reports on the agricultural condition of the country.

AGRICULTURAL INSTRUCTION IN RUSSIA.

Russia sustains sixty-eight agricultural schools, containing 3,150 pupils, at a cost of \$403,500, of which sum the government pays \$277,500 and the local societies or the school founders pay \$136,000.

AGRICULTURAL INSTRUCTION IN GERMANY.

The German system is based on the theory that schools and colleges are the only places where theoretical agriculture can be properly taught. Few of the higher educational schools first established were exclusively such. A liberal education could be obtained at most of them without touching the subject of agriculture. Later educators have developed a system which begins by fostering a love for nature in the minds of the pupils in the kindergarten, and patiently develops that love through all the dozen or more grades of schools until it culminates in the polytechnic school or the degree granted by the university. The state maintains three grades of agricultural schools, higher, middle, and lower, and expends something like \$200,000 annually on agricultural education.

In Germany agricultural education has so broadened out as to include training in every technical part of the farmer's work — culture of forests, fruits, flowers, and vines; schools to teach wine, cider and beer making, machine repairing; engine running, barn construction, and surveying; knowledge of poultry, bees, and silk-worm raising; domestic economy, sewing and accounts for farm women — all in addition to the long scientific courses of study and years of practical work on an established farm.

A special feature of agricultural teaching in Germany, is the traveling professor. Former United States Consul Monaghan, now connected with the School of Commerce of the University, speaks thus of him:—“ These teachers, supported partly by the state, and by agricultural unions, go from place to place, and lecture on

agricultural and horticultural subjects. Their purpose is to lift up and enoble agricultural life; to afford the farmer the knowledge gleaned by science since he left the school; to impart to him the best methods of selecting soils, fertilizers, cattle, trees, etc.; to teach him how to use his lands to best advantage, to graft, to breed in; to get the best, quickest, and most profitable results. These teachers are skilled scientists, practical workers, not theorists, perfectly familiar with the wants and needs of their districts. Armed with this knowledge, the teacher's usefulness is certain and unlimited. When he speaks his voice is that of one in authority, it is heeded. He is a walking encyclopedia of knowledge, especially of knowledge pertaining to the woods, hills, farms, and fields."

AGRICULTURAL INSTRUCTION IN HOLLAND.

Holland has done little in the way of elementary education in this branch. No success has resulted from attempts to introduce agricultural teaching in the primary schools. In 1897 Holland expended \$350,000 on its agricultural department, most of which was used in maintaining advanced schools.

AGRICULTURAL INSTRUCTION IN SCOTLAND.

In the public schools of Scotland, agricultural science is arranged for as an optional study from the third to the sixth grade, inclusive. In 1895-96, 4,148 pupils passed examinations in the subject, and the cost of this to the state was over \$200,000. In 1896 and '97, of the pupils in the "Evening Continuation Schools" where instruction is given to those who have finished the work in the primary schools, 1,089 persons passed the examination in agriculture, and 115 others in horticulture.

AGRICULTURAL INSTRUCTION IN ENGLAND AND WALES.

Agricultural colleges have been established in both England and Wales, to give advanced instruction in agriculture. In 1898 and '99, grants were made from fifteen colleges and associations for this work, amounting to over \$35,000. Besides this direct government

subsidy to higher education, the state grants to the several counties part of the money raised from the excise ("drink money") for educational purposes, out of which more than \$375,000 were spent by the committees in 1896-'97 in promoting agricultural education. The state recognizes instruction in the principles of agriculture as instruction in elementary science, and through grants to primary and secondary schools and to teachers' colleges, it encourages agricultural education as a technical study. In 1896-'97, 1,023 pupils passed examinations in this subject, and the respective school managements received as grant on their account, a total sum of nearly \$700,000. In 1897 the Royal Commission on "Agricultural Depression in England," declared in its report: "We believe that it is essential for the welfare of agriculture that there should be placed within the reach of every young farmer a sound, general school education, including such a grounding in the elements of sciences bearing upon agriculture — e. g., chemistry, geology, botany, and animal physiology — as will give him an intelligent interest in them and familiarize him in their language."

AGRICULTURAL INSTRUCTION IN CANADA.

In 1872 an effort was made to introduce agricultural instruction into the rural schools in the Province of Ontario. The work proved a complete failure, because of the lack of teachers prepared to give this instruction, and for more than twenty-five years the subject dropped entirely out of sight. Within the last three years, this subject has again come to the front, and at present provision is made for teaching the elements of agriculture in all the rural schools of the Province. The experiment is likely to succeed because teachers in these schools are now required to have, as a qualification for teaching, special training in the elements of agriculture. Similar work is being undertaken in other Canadian provinces. Ample provision is made for higher education in agricultural subjects throughout the Dominion.

AGRICULTURAL INSTRUCTION IN OTHER COUNTRIES.

But little has been attempted in the other countries of the world in the way of elementary instruction in agriculture, but institutions are being opened furnishing facilities for advanced instruction and agricultural research. Such institutions have been organized in Hindustan, in New Zealand, in Queensland, in South Australia, in Victoria, in New South Wales, in Cape Colony, in South Africa, in Uruguay, in Chili, in Egypt, and in Japan.

AGRICULTURAL INSTRUCTION IN THE UNITED STATES.

In addition to the work of the Department of Agriculture, agricultural colleges have been established in most states of the Union. Elementary instruction in agriculture has hardly made a beginning in this country. At the present time an interesting experiment is being carried on in the state of New York, under the auspices of the Agricultural Department of Cornell University, by introducing nature study into the public schools of the state. Nearly \$20,000 appropriated by the state is expended annually in this effort. The plan of work is the most systematic yet attempted in the United States, and will undoubtedly produce practical results in awakening an interest in the possibilities of agricultural life. The one drawback to its complete success is the lack of teachers trained to do the work intelligently and thoroughly.

In Missouri the question of elementary instruction in agriculture is attracting a large amount of attention and the state university at its summer session last year, offered courses of instruction for teachers of rural schools in the elements of agriculture. A large number of teachers were in attendance and evinced a deep interest in the work done. A well organized movement is on foot to make this subject a part of the common school course in that state.

In Illinois and Minnesota the subject is being discussed by educational men, and in the near future it is likely that a definite effort will be made to provide for instruction in this subject in the common schools.

In other states the subject is rapidly coming to the front, and is being discussed in farmers' institutes, and in meetings of those interested in the general subject of agriculture.

I have not attempted in this survey of the field, to present the scope and character of work in the higher educational institutions devoted to agriculture. It appears that in every case the work in this subject has begun with the establishment of this class of institutions, and as interest has developed, and people have come to understand the possibility and necessity of applying scientific principles in the art of agriculture, the demand has come for an extension of the work so as to reach a much larger number through the elementary schools. The experiments in Canada, Ireland, England, and France in carrying this subject into the primary schools, or schools of the same grade as our country district schools, seem to indicate that but little can be done in this direction for two reasons, first, because of the immaturity of the pupils, and second, because of the lack of properly trained teachers. The first objection can not be overcome, the second may be, to a considerable extent. Whatever can be done to overcome this objection through better training of teachers for this work in the normal schools, in county training schools, and in teachers' institutes, should be done. As already indicated, work in this direction has been begun in some of the normal schools, is being carried on in the county training schools, and also in the teachers' institutes. There is every reason to believe that in these three fields the work will be steadily strengthened. A statutory requirement that in order to secure a third grade certificate, teachers should pass a satisfactory examination in the elements of agriculture, after due notice being given, would awaken an interest in this matter on the part of teachers, would enable those in charge of the institutes to secure better results in this subject, and would result in the introduction of the instruction into many of the common schools. To require the teaching of this subject by law in all the district schools of the state, would under existing conditions, in my judgment, be a grave mistake. Public interest must be aroused, a sentiment created, which shall demand this instruction, and

demand the preparation of teachers for giving it. It will then come in a natural way, and in no other way can it be made a success.

Following what has been the historical development of agricultural education in other countries, there can be no question as to the desirability of organizing a distinct class of schools not now existing in this state, designed primarily to fill a gap in the educational facilities offered to the country boys and girls in our present system. These schools should fill the place in our system which the elementary schools of agriculture have so adequately filled in Norway, Sweden, Finland, Denmark, Switzerland, Belgium, and France.

RECOMMENDATIONS.

I recommend that the present law relating to the qualifications of teachers be so amended as to require an examination in the Elements of Agriculture in addition to the other subjects upon which an examination is required for a third grade certificate.

I recommend further, that through legislative action, authority be given to county boards of supervisors to establish and maintain schools to be known as County Schools for Instruction in Agriculture and Domestic Economy, and that state aid be given to these schools when organized and established on a basis to be approved by state authority. The amount of state aid should be at least one-half the sum actually expended for purposes of instruction in such school. While the county should be made the unit as the basis of organization, pupils from other counties should be allowed to enter such schools until their full capacity is reached, on payment of tuition. This school should be open to boys and girls upon completion of the common school course of study in the district schools.

COURSE OF STUDY IN AGRICULTURE AND DOMESTIC ECONOMY FOR THE PROPOSED SCHOOLS.

In a bulletin issued last year from the office of the state superintendent, the question of what might properly be attempted in this class of schools was fully discussed. I quote from that bulletin;

“Without attempting to go into detail, it seems entirely reasonable to assume that instruction may be given profitably in schools of the class just suggested, in the following subjects:

The Soil.

Plant Life.

Animal Life.

Economics of Agriculture.

Manual Training.

Domestic Economy.

In dealing with the first topic, *The Soil*, consideration should be given to its composition, modes of cultivation, fertilization, drainage, effect of rotation of crops upon the soil, means of restoring worn out soil to condition of fertility, and the adaptation of different soils to different classes of products..

Under the second topic, *Plant Life*, there should be a consideration of the various forms of cultivated plants, including a knowledge of best varieties for local cultivation; germination; modes of growth; modes of harvesting, care for after harvesting, effect upon soil; economic values for marketing, for feeding and for fertilization. For the boy who is to be a farmer, or the girl who is to be a farmer's wife, and possibly for any other boy or girl, the botany of the corn plants, the modes of growth of other forms of plant life on the farm, if properly taught, may prove at least of as much value as the study of mosses, or other forms of plant life upon which much time is now spent in the field of botanical instruction. This study would be for him a matter of practical utility, and would give him knowledge that would awaken an interest in the growth of agricultural products, resulting in more intelligent cultivation, better adaptation of crops to soil, and better financial returns.

Treatment of the third topic, *Animal Life*, should provide for a study of the domestic animals grown for pleasure or profit, including a knowledge of breeds and breeding; feeding; judging; care, including the prevention and treatment of the diseases of domestic animals; preparation for marketing either the animals or their products; and such knowledge of animal pests, and of the modes of treatment for the prevention of their rav-

ages, thus far discovered, as would enable the farmer to save many a crop which otherwise might be ruined. Might not such knowledge be so organized and taught as to be of at least as great value, both for knowledge and for training, as the study of the tadpole, the crayfish, and the angle-worm?

In treating the fourth topic, *The Economics of Agriculture*, study should be made of the relations of the farmers to general industrial and commercial organizations, of the economics of farm life, including a practical system of domestic accounting, which would enable him to tell with the same accuracy that the manufacturer tells, the cost of any given product during any given period of time.

Under the fifth topic, *Manual Training*, instruction could profitably be given in wood working, not only for the purposes of hand and eye training, but for the practical knowledge and skill resulting from such training, and which would be of value to him as a farmer. To this might be added elementary instruction in blacksmithing, which would enable him to make any of the simple repairs of tools at home, that otherwise he would be compelled to have done at a distance from his own home, and with considerable expenditure of time and money.

Under the general subject, *Domestic Economy*, instruction could be given in sewing, including dress making and millinery work, which certainly would be of value to the girls who are either to perform these lines of work for themselves, or to supervise that work when done for them by others. It would not only develop skill, but would cultivate the taste, and develop a knowledge of the difficulties incident to such work which would make them more considerate of those who might be in their employ, or under their supervision.

In cooking, a course of instruction might properly be given which should include a knowledge of the constituent elements of food products, and their value for definite purposes, which would enable them to construct for the animal, man, a balanced ration. For all concerned this is perhaps as important as the determination of a balanced ration for the cow or the hog. It should also include a knowledge of invalid cooking,

which would enable them to know what are proper foods for invalids and how to prepare such food. Such a course of training would develop economy and skill in the choice and preparation of food which would not only result in the saving of money, but in the better physical, mental, and moral condition of those fed. To this might be added practical instruction in the different details of housekeeping which would add much to the appearance, pleasure and comfort of the home.

In horticulture and floriculture, instruction might be given which would be of value to both girls and boys in the matter of adornment and beautifying of the home surroundings.

For the work on the soil, on plant life, and animal life, and in cooking, a knowledge of essential scientific principles and their application would be necessary. It would not be necessary, even though it were desirable, to give extended courses in geology, botany, zoology, physics, and chemistry in order to place this instruction on a rational, scientific basis. For the teacher, it would be essential that he decide what is to be taught in any one of these branches, and then to decide what knowledge of science is necessary in order that the desired instruction may be properly given.

It must be apparent that in this report it would be entirely improper to attempt to go into detail as to the precise things which should be taught in each of these subjects. The only question is, do these subjects, taken together, contain a body of knowledge of high utility to the country boy and girl, and which may be taught to them. I have already indicated my belief that these subjects do embrace such a body of knowledge, and that under proper conditions that knowledge may be taught.

WILL THIS BODY OF KNOWLEDGE IF TAUGHT, AND THE TRAINING COMING WITH THE MASTERY OF IT, BE OF GREATER PRACTICAL VALUE TO THESE PUPILS THAN ANY OTHER BODY OF KNOWLEDGE, AND ACCOMPANYING TRAINING WHICH COULD BE GIVEN DURING THE SAME TIME.

This question is one which it seems to me needs but little discussion. It is a body of knowledge which directly concerns these people in their subsequent voca-

tions. It is a kind of knowledge which is essential to-day for success in those vocations. It is a kind of knowledge, both in scope and character, which will rarely be obtained by the individual unless obtained in the school. Is there any other body of knowledge which could be substituted for it, and which would be of higher utility to these people for all the practical purposes of life? If there be such another body of knowledge, I do not know what it is. I am thoroughly convinced that it is not the body of knowledge that these young people now get, even the few of them who complete the work of the secondary schools. Will the effort put forth in acquiring this knowledge result in training as valuable as the training resulting from the acquisition of a body of knowledge of less practical value? I am one of those people who believe that knowledge may be valuable in itself and that its acquisition may furnish the highest kind of training; that the student who spends time anywhere in any grade of school in acquiring knowledge of value only for training, when he might acquire knowledge valuable for other purposes, and equally valuable for training, is wasting his time and energy. A five-dollar gold piece has a certain definite value, but the individual who would accept a five-dollar gold piece when he had his option either to take that or a ten-dollar gold piece, would be a fool. The essence of training is doing. In nearly every one of these lines of work suggested, the student is brought into direct contact with things, is trained to study them and their relations to each other, to himself, and to other things; he would furthermore be constantly employed in dealing with these things, and not with words. He would be required to see something, and to do something at every stage of his work, and the seeing and doing would be guided by thoughtful consideration of means and ends. This training, while it would be general in its scope would, at the same time, be specific in nature as well; as it would develop skill along the lines where skill would be needed in his subsequent work. Do not these conditions furnish the best possible elements, both for the training of the mental and physical activities of the individual?

One of the chief purposes in education should be to develop interests, and one of the very necessary outcomes of such a course of training would be to develop an intelligent interest in the activities incident to rural life.

ADDITIONAL WORK TO BE OFFERED IN THESE COUNTY SCHOOLS.

In addition to the work already suggested, there should be given such instruction in language, mathematics, history, and literature as may be carried on in connection with the other work. Such a school should have in connection with it, a small tract of land, to be used for illustrative and experimental purposes: not the line of experiments which the Agricultural Experiment Station undertakes, but a more simple line, which could be carried on under the direction of the teachers, and which would be of value for observation and training purposes. The length of the course offered in these schools should not be less than two years. Special courses should be offered to meet the needs of the older boys in the county, who may have been out of school for two or three years, but who could attend during the winter months with advantage.

Such a school centrally located in a county, would furnish an opportunity for attendance by residents of the county at a very moderate expense. Many of the pupils could board at their own homes, while others could board themselves, returning home on Friday night to remain over Sunday.

The school would necessarily have to be equipped with such simple laboratory apparatus as would be necessary for the experimental work in science. It would need a well selected library of books on agriculture and domestic economy and should be supplied with the best periodical literature pertaining to those subjects. It could be made a distributing center for the county, of the bulletins sent out from the agricultural colleges, and if effort were made to interest pupils in such of these bulletins as came within the range of their comprehension, they in turn would interest their parents in them. The result would be that where one such bulle-

tin is now read in a community, ten would then be read, and with greater interest and more intelligence. Such a school would also be a center for meetings of farmers for discussion upon agricultural subjects. When a number of such schools were established, professors could be sent out from the agricultural college, going from one to another, remaining a sufficient time at each to give instruction not only to the students, but to farmers who might care to attend, in various subjects which could not be taken up in the school itself. The dairy industry, for instance, would furnish an excellent field for such work. The example of Denmark and Germany furnishes an excellent illustration of the value of such traveling professors.

It is needless to say that for the successful operation of such a school, it would be necessary to secure teachers specially trained for such work, and of the very highest order. The head of the school should be a man acquainted with farm life, trained as a teacher, one who had had experience in teaching, and added to this, a thorough training in the best institutions devoted to agricultural instruction. He must be a man who would command the respect and confidence of the farming community, able to adapt himself to conditions about him, and one who would be able to speak with authority upon all matters of practical and theoretical agriculture. He would need two assistants, a man to take charge of the work in manual training, and a woman to take charge of the work in domestic economy. These three teachers would be able to carry on all the different lines of work in a school of ordinary size. With such a school as this organized in a county, it would be possible through its teaching force, to organize the work in nature study in the district schools. During the summer vacation, these teachers could assist in the teachers' institute to be held in the county, giving instruction in this subject. They could present and give instruction in a plan of work to be carried out in the country schools of the county during the year, and in co-operation with the county superintendent, could meet these teachers at different times during the year, to hear their reports of progress, and of difficulties encountered, and to aid them by suggestion and

instruction. In this way it would be possible to carry the work from the higher school into the lower schools, with successful results.

PRELIMINARY WORK NEEDED.

Should the legislature see fit to authorize the establishment of such schools, a large amount of preliminary work would be necessary before their organization could be successfully completed. At the present time, there are almost no text books adapted to the course of instruction in agriculture outlined for these schools. The body of knowledge to be taught in such schools would have to be selected, put into proper form, and organized, in order to make the work a success. As soon as it became apparent that schools of this class were to find a place in our educational system, men competent to do this work would be found ready to undertake it, but until it becomes evident that there will be a demand for the class of text books necessary for use, few competent men will care to undertake their preparation. To begin the work some provision should be made for at least a tentative preparation and organization of the matter selected for instruction.

Still another line of work would of necessity have to be undertaken, that of awakening an interest on the part of farmers in any given community which would result in a demand upon the county board, for such a school. Its advantages must be explained to them, and made clear, and appreciated, before success can be hoped for.

I believe the foregoing plan is a feasible one, that it will command the support of the people most interested—the farmers, that it will show tangible results early, and that as the system is extended, it will awaken the intelligence of the community where the schools may be, and arouse an interest in the matters pertaining to farm life, which will give us better trained and more successful farmers, as well as better trained men and women and better citizens.

REPORT ON MANUAL TRAINING.

MANUAL TRAINING IN GRADES BELOW THE HIGH SCHOOL.

The growth of public sentiment in favor of making manual training a part of the public school course, in the United States, is shown by the report of the United States Commissioner of Education for the year 1897-'98. That report shows that in 1890 there were 37 cities of 8,000 population and over in whose public schools manual training other than drawing was taught; in 1894 there were 93 cities; in 1896 there were 121 cities, and in 1898 there were 146 cities.

For the same year there were 114 manual or industrial training schools, an increase of 15 over the preceding year. Of the 114 schools, 24 were industrial schools for Indian children. In the 90 manual and industrial training schools, other than Indian schools, there were employed 673 teachers, 384 men and 289 women. In the same schools there were 25,893 pupils, 16,447 boys and 9,446 girls. The total expenditure for manual and industrial training by 86 of the 114 schools reporting was \$655,247. Of this amount \$440,572 was paid teachers, \$93,058 for materials, \$36,508 for tools and repairs, and \$85,109 for incidentals and for items not classified.

No statistics are given showing the expenditure for manual training in the 146 cities which reported this work as being carried on. Of these cities, sixteen report work as being begun in the first grade, and carried on through the eighth grade; four report the work as beginning in the second grade; three in the third; five in the fourth; fourteen in the fifth; fifteen in the sixth; thirty-one in the seventh; eight in the eighth, and in the remainder the work is begun in the high school.

In Wisconsin there were last year nine cities which carried on manual training in the high school. In one of these the work was extended to the eighth grade, and in two, throughout the grades. It thus appears that in Wisconsin but little progress has been made toward the introduction of manual training elsewhere than in the high school.

Correspondence and personal conferences with teachers and members of school boards, and prominent citizens in many of the cities of the state, reveal the fact that at the present time there is a large amount of interest in the subject of manual training. There is a steadily growing belief that if manual training has the educational value claimed for it, it should find a place earlier in the course, and should not be postponed until the high school course, when seven-eighths of the pupils have left the public schools. The fact that manual training has secured its first foothold in the high schools rather than in the lower grades, is no justification for such a condition from an educational standpoint. It was put there for other than educational reasons.

First, because it was easy to incorporate into the high school course the work which had been developed and organized for the pure manual training schools. The problem of manual training in the grades had not been worked out as thoroughly as for pupils in the high school stage.

Second, it was easier to interest the public in a proposition to connect this work with the high school than to make it available for pupils of all grades. The latter proposition seemed to be too large an undertaking for many communities, and especially for those having no experience in this line of work.

Third, it was easier to construct a high school course carrying manual training, than to reorganize the course of instruction in the grades so as to make a place for it.

Fourth, there has been a too prevalent idea that manual training was to be carried on for industrial purposes, rather than for educational purposes, and that therefore it should come at a time when pupils were seeking preparation for commencement in some vocation.

In later years the idea long held by intelligent advocates of manual training, that its value is primarily an

educational one, rather than industrial, has come to be accepted by large numbers of people who have been giving the subject some consideration. It is now generally recognized that its value is twofold, primarily for educational purposes, and secondarily for industrial ends.

THE VALUE AND PLACE OF MANUAL TRAINING FOR EDUCATIONAL PURPOSES.

Members of society may be roughly classed into four groups; those who *think* without doing; those who *do* without thinking; those who *neither* think nor do; and those who *think*, and *do* because of their thinking. The fourth class comprises the productive, constructive, organizing element of society. It is the function of the public schools to produce members of this fourth class. It must be evident to all that for the production of a thinking and doing individual, the two forms of activity should be carried on side by side; the doing growing out of the thinking, the thinking made clear and definite through the doing. The fact so often stated, that the leaders in industrial, commercial, and professional fields of activity come largely from the country, does not prove as is frequently claimed, that the training of the country schools is better than that afforded in the cities, but rather that the necessities of country life have from the earliest period of the child's activity, demanded of him physical action for definite ends, determined by mental activity toward the same end. The mental training afforded by the course of instruction in our public schools, should not be underestimated, even though it be proved that this training has come almost exclusively from a study of books rather than from a judicious combination of the study of books and things. Our error has been that we have too long held the notion that mental development is secured in no other way than through a study of books.

Mental power comes through organized thinking. The mere memorizing of what others have said, or learning about what others have done, is not organized thinking, and gives little or no mental training. Organized thinking comes whenever the individual sets himself a definite task to do; and then determines and

applies the ways and means necessary for the accomplishment of that task. This task may be the solution of a problem in arithmetic, or it may be the construction from pieces of shingle of a water-wheel to be turned by the brook. I believe the latter to be of the higher value because it demands the use of tools and material. The tools cannot be used successfully upon the material to produce the desired result, without the exercise of the closest attention and of the judgment in their use. There can be no training of the hand which does not involve mental activity, and the mental activity thus involved is of a kind which furnishes just the training needed for the practical concerns of life. It is a mental activity out of which grows skill in doing, and skill in doing as a result of intelligent thinking should be one of the chief purposes of education.

It is the ambition of every boy at a very early age, to become the owner of a pocket knife. The reason for this is that the pocket knife is the tool which for him furnishes the largest opportunities for the exercise of his inherent desire to do. No one thinks of denying him the pocket knife because of the fear that its use will compel him to become a mere whittler; but on the contrary, the thoughtful parent will furnish it because of its value as an instrument in the training of the child's manual and mental powers.

Because in the manual training school the child learns to use a plane, or a saw, it does not follow that he is to be a carpenter. Because the girl learns to sew, that she must be a seamstress, or because she learns the value of foods and how to prepare them, that she must therefore be a cook. The use of the plane and the saw will be of value to the boy should he decide to become a carpenter. The training in sewing and cooking will be of value to the girl should she decide to become a seamstress or a cook, or should she be compelled to take the place of either seamstress or cook, even temporarily. But in any case, the training thus afforded will be of the highest value in the development of the individual because it demands first, concentration of attention, and thus develops that quality so essential to success in any field of human endeavor. Second, it requires organized thinking in the adaptation of means to ends, a demand which will be constant through life; and

third it demands an exercise of the will power resulting in *doing* for the realization of those ends, and through the doing, there comes a clarification of the thinking. It is not claimed that this sort of training and the knowledge and the skill which it brings, constitute all that is necessary in the education of the child, but the claim is made, and well made, that any system of education which leaves out this kind of training omits one of the essential requisites in the proper education of the child.

I believe that any one who will analyze closely the mental processes involved in the mastery of a lesson in grammar, in history, in geography, or in any of the branches taught in the public school, and compare them with the mental processes involved in making a working drawing of a model in wood, and then from that drawing, by the use of tools, reproducing the model, will see that for all purposes of mental training the latter is of no less value, to say the least, than the former. It has the added value in that it has developed control of the hand, and skill in its use, which will be of value in other fields of work where manual skill is required. More than this, if this work be done during school hours, it gives a change of position, a change of interest, and physical exercise which will send the pupil back to his purely mental tasks refreshed and invigorated, and able to accomplish more in the next half hour, than he would have been able to do in that half hour and in all the time given to the manual training exercise taken together.

If what has been said thus far is true, it must be evident that this work should be begun early in the school course, and adapted to the needs of the child at every stage in his development. To shut up the child from six to twelve years of age in a school room for six hours a day, and to compel him during that time to devote himself to a study of books, is little short of cruelty. It is the period of his life when the impulse toward physical activity is the strongest, and here at least nature has made no mistake. It is in the school system which denies the opportunities for the exercise of that

impulse that the mistake has been made. Manual training during this period furnishes an opportunity for the exercise of this physical impulse and at the same time directs and controls its activity for educational ends.

THE VALUE OF MANUAL TRAINING FROM THE INDUSTRIAL STANDPOINT.

Less than three hundred years ago, the territory which is now known as the United States was an unbroken wilderness. When we contrast the condition then with that of to-day and analyze the elements which have entered into the solution of the problem, we shall be struck by the fact that the conditions existing to-day are due primarily to thinking, and this will emphasize to us the value of an education which trains the thinking powers. We shall also be struck by the further thought that no step forward could be made toward the subjugation of this wilderness, and fitting it for the abode of man, no matter how much thinking were done, until the combined activities of hand and eye were brought into action to make the thinking serviceable for man's uses. We shall be further struck by the thought that when the hands have put into form the results of men's thinking, every new form becomes the starting point for a new process of thinking, resulting in higher ideals and more perfect adaptation of the forces of nature to man's uses, but which again could be realized only through the work of the hand. Thus thinking gives occasion for doing, doing invites and compels additional thinking, and this again further doing.

Mr. Hodge, the Secretary of the International Committee of the Y. M. C. A., after careful study of statistics relating to the subject of the educational preparation made by the young men of the United States, between the ages of sixteen and thirty-five, reports as follows: "Of thirteen million young men in the United States between these ages only five in every one hundred have been specially prepared for their occupations by education received at some kind of a school." He also found that of every one hundred

graduates of our grammar schools, only eight obtain their livelihood by means of the professions and commercial business, while the remaining ninety-two support themselves and their families by means of their hands. If the statistics are correct, and an examination into conditions existing in any community will seem to substantiate them, it must be evident that the education given in the grades below the high school, which does not make provision for some training of the hand and eye, as well as of the brain, is failing to do for these children what they have a right to demand shall be done for them, and what society has the highest interest in demanding shall be done for them.

If ninety-two out of every hundred children in the grades are to earn their living by their hands, does it not seem that the educational system is out of joint which fails to give them during the most impressionable and formative period of their lives, such training as will fit them the earlier to become skilled in whatever department of manual labor they may engage, and thus to make them more productive members of society, as well as more self-respecting? It is true that manual training dignifies labor, and gives to those who engage in it a respect for work as well as a habit of work, and an interest in their work.

One of the large purposes of the public school is to create wholesome interests. In what better field can one's interests be awakened than in this field which recognizes doing as of equal importance with thinking, and of infinitely more importance than idle dreaming?

This training both from an educational and from an industrial standpoint is of no less importance for girls, than for boys. The great mass of girls, as well as of boys, will find their life work in the labor of their hands. Whatever value educationally this training may have for the boy, it has also for the girl. While the girl may not, to the same extent as the boy, become a wage earner, in the discharge of her functions as a homemaker she will find constant demands upon her not only for thinking, but for doing as well. Under present conditions, the girl has not the same opportunities for that training in her own home which will fit her for later responsibilities that she formerly had. The length of the school year has been steadily increasing until at the

present time she is constantly in school for nine to ten months in the year. The demands which the school make upon her are so great that what little time and energy are left for learning the household arts in the home, even granting that conditions are such as to render that learning possible, are inadequate for the purpose. Such systematic training in these arts as is now given in many localities, and can be given in any school system, would make her more independent and more useful as a member of society, and would result in securing better conditions in her future home than are likely to exist without such training. The family would be better fed, and more economically fed, the home would be furnished with more taste and without greater expense, and she and her children dressed with better taste, and without greater cost, than would be possible without such training.

DEVELOPMENT OF MANUAL TRAINING IN THE SCHOOLS OF FOREIGN COUNTRIES.

FINLAND.

Within the present century, Finland was the first country to give a recognized place in the curriculum of its primary schools, to wood work and other manual exercise. In 1866, instruction in some branch of manual work such as wood work, basket work, tin work or iron work, was made compulsory in the Training Colleges for male teachers, and in all primary schools for boys in country districts.

NORWAY.

In Norway this branch of school work was first recognized in the official program in 1860. It is only within recent years that much attention has been given to the usefulness of a system of manual exercises as a branch of general primary education. Since 1891 it has been compulsory in all Norwegian Training Colleges and town schools.

SWEDEN.

In Sweden the movement for manual work in the schools was at first an effort to revive the old Swedish tradition of domestic industry. The failure of the early schools of domestic industry coupled with the experience of Finland, led the Swedish authorities to encourage the strictly educational side of the work, and to connect it under the name of Sloyd, with the elementary school curriculum.

In 1875, the well known training school for teachers in Sloyd, at Naäs, was established by a local land owner, Herr Abrahamson. The work of this training school which for years has been under the direction of Herr Otto Salomon, has been one of the most important agencies in disseminating throughout northern Europe a knowledge of the theory and practice of wood work as a branch of the work of the primary schools. It is stated that twenty-four hundred teachers of Sloyd (including six hundred foreigners), had been trained in this school down to 1896.

In 1896, instruction in Sloyd wood work was given in two thousand schools in Sweden, and in all the seven training colleges of that country.

HOLLAND.

Since 1891, manual school work has been a compulsory subject in the training colleges for men. There are also courses to enable older teachers to acquire skill in giving instruction in manual work.

BELGIUM.

Instruction in manual work such as wood work, is given in many of the Belgian training colleges, but the subject is not obligatory either in the training colleges or in the schools. In many districts, however, advantage has been taken of the law of 1884, which empowers local authorities to introduce manual work as a school subject.

AUSTRIA.

Since 1883, this subject has been recognized as an optional branch of school work in Austrian town schools. Of late years special attention has been given to it in Vienna.

GERMANY.

In Germany there is in progress a movement for the introduction of wood work and other manual exercises as a part of primary education. This movement is inspired by the educational idea, rather than the industrial, and is steadily gaining ground. Its claim for state aid has been recognized. The governments of Prussia, Saxony, and Baden now make state contributions in aid of this branch of school work.

In 1898, manual exercises of various kinds had been introduced into six hundred schools in Germany. Wood work was taught in three hundred schools, metal work in forty-three, card board work in four hundred sixty-three. In many of the German training colleges, provision is now made for training teachers to give instruction in these and similar subjects.

SWITZERLAND.

Of the twenty-five Swiss Cantons, nineteen have made provision for wood work and other manual exercises in school. The expenses are borne to a large extent by public funds. The Federal government bears the whole expense incurred by the training colleges, in the special training of teachers for this department of school work.

FRANCE.

In 1882, a law was passed making manual work such as wood work, involving the use of the principal tools obligatory in the elementary schools of France. Although the enactment was a compulsory one, nothing seems to have been done for the special training of the teachers, and as a result, the carrying out of such an enactment was a matter of absolute impossibility. The experience of France in this matter illustrates the futil-

ity of making compulsory laws for the teaching of subjects in the schools, without making provision for the training of teachers, where special training is a necessity. In Paris, a program admirably arranged on educational lines is in operation in the city schools, but outside of this city the law seems to a large extent to have remained a dead letter.

ENGLAND.

In England the introduction of educational hand work of any kind in classes outside the kindergarten department, was first authorized by the state in 1890, when wood work was recognized as a school subject in the upper intermediate and grammar grades. In the larger cities considerable progress has been made, not only in the introduction of paper and card board work, clay modeling and wood work, but also in sewing, cooking, and laundry work.

RECOMMENDATIONS OF THE COMMISSION APPOINTED BY THE LORD LIEUTENANT OF IRELAND IN 1897, TO DETERMINE HOW FAR AND IN WHAT FORM, MANUAL AND PRACTICAL INSTRUCTION SHOULD BE INCLUDED IN THE EDUCATIONAL SYSTEM OF THE PRIMARY SCHOOLS UNDER THE BOARD OF NATIONAL EDUCATION IN IRELAND.

This commission was composed of fourteen of the most eminent men in Ireland, and continued its investigations for two years. The commission held ninety-three meetings of which fifty-seven were sittings for receiving evidence. They took the evidence of one hundred and eighty-six persons qualified to give information on matters under consideration, and visited one hundred and nineteen schools where manual and practical instruction were being given. Germany, France, Switzerland, Holland, and Belgium as well as England, and Scotland, were visited by members of the commission for the purpose of making personal investigation of the work being done in these countries.

The investigation made by this commission is probably the most thorough and exhaustive ever under-

taken. For that reason considerable space is taken in this report for a statement of their conclusions. As a result of their investigations, the commission reported as follows:

"We recommend that a course of woodwork, based on the lines of the Swedish system, with such modifications as the experience of other countries, especially of England and of Scotland, has shown to be useful, should at once be introduced into the program of the National Education Board. It will obviously be necessary for the board in this case, as in the case of the hand and eye training courses, to secure the services of competent organizers having practical experience in the work.

"We do not consider that woodwork should be made a compulsory subject. As to this, we direct attention to the evidence given by Herr Salomon. It is his opinion that one reason of the great and growing success of the Sloyd movement in Sweden is that in that country the subject has from the beginning been treated as an optional one. He gives some interesting figures. Sloyd was first introduced into the Swedish school programme in 1877. In the next year, the number of schools in which it was taught was 103. Nine years afterwards, in 1887, the number was 991. Seven years later, in 1894, it had grown to 1,887, or very nearly one-half of the total number of schools in Sweden. In 1895, a different method of distributing the grant for Sloyd teaching was adopted, the new unit of distribution being, not a school, but a "division," each division being a class of from 10 to 15 pupils. In that year grants were paid for 2,483 such classes. By way of contrast, Herr Salomon points to the cases of France and Norway, where the mistake was made of introducing woodwork as a compulsory subject. 'The result,' he says, 'has been unsuccessful. If the subject be introduced on a small scale, it will grow; our experience in Sweden has shown that if we begin with small arrangements, they will grow more and more.'

"So far from suggesting that the subject be made compulsory in Ireland, we are strongly of opinion, for reasons similar to those stated by us in reference to the hand and eye training courses that care should be taken by the National Education Board to hinder its being taken up by any but really competent teachers."

"We recommend that provision should at once be made for the introduction of courses of Hand and Eye Training in the Irish National Schools." (By Hand and Eye Training is meant paper cutting, folding, card board work, and clay modeling, accompanied by drawing.) "Such exercises obviously have special utility in forming a natural link between kindergarten occupations in the infants' classes, and exercises such as those in woodwork, in the higher classes in the school. But we consider that their value is practically independent of this, and that they may be introduced with great advantage into schools where, from any cause, they may neither have been preceded by the kindergarten occupations, on the one hand, nor be followed by more highly developed Manual Instruction, such as that in woodwork, on the other."

"As regards the amount of time to be allowed to the exercises of the Hand and Eye Training course, the evidence also shows that one and one-half or two hours per week is sufficient."

"We regard Cookery as a most important branch of practical instruction. We are of opinion that this useful subject should be encouraged in the schools. Instruction might in many cases be given by special teachers in Centers where the classes could be attended by the pupils from schools in the immediate neighborhood; in others the instruction in this subject must be given by the ordinary school teacher. In the latter case special provision must be made for the training of the teachers by itinerant teachers or otherwise. We consider that the teaching of this subject should be

continuous, not in the sense that it should be taught every day, but that it should be taught in one or more classes each week, throughout the year or a considerable part of it. The practical lessons should be supplemented by lessons in theory and both should be interdependent. The scientific principles underlying the subject should be explained and illustrated by experiments, as a part of the object lesson and other science lessons in the school. The importance of accuracy in weighing and measuring should be insisted upon; the blackboard should be used for the setting out of directions; the reasons of the processes should be explained; the children should write notes of the lesson, and a statement of the results of their work. These notes should be carefully revised by the teacher, bad handwriting, incorrect modes of expression, and errors in spelling, should be pointed out and corrected. The course should include demonstration lessons in which the processes should be gone through and explained by the teacher, and practice lessons in which the same processes should be gone through by the pupil. During the demonstration simple lectures should be given, dealing with all points of the subject; e. g., the current prices of provisions, the cost of a meal, the methods of selecting meat. The character of the instruction should be tested by occasional visits of the Inspector whilst the classes are being taught, and in such other way as the Commissioners of National Education may determine."

The Commission also recommended that instruction should be given under the head of domestic economy, upon the following subjects: Food; clothing; cleanliness; the dwelling; simple ailments, and in hygiene:— air; breathing; ventilation; water; alcoholic liquors; food. Upon this subject they say: "The acquiring of information on such subjects from text books is useful, but it is still more necessary that a power of applying this information should be gained. Such a power can only be gained by a thorough knowledge of the principles involved, such as can be obtained from actual experimental observation."

The general conclusions reached by the Commission are summed up in the following statement:—"We may at once express our strong conviction that Manual and Practical Instruction ought to be introduced, as far as possible, into all schools where it does not at present exist, and that, in those schools where it does exist, it ought to be largely developed and extended. We are satisfied that such a change will not involve any detriment to the literary education of the pupils, while it will contribute largely to develop their faculties, to quicken their intelligence, and to fit them better for their work in life."

THE SLOYD SYSTEM.

As the course in Woodwork recommended by the Commission, is based on the lines of the Swedish system of Sloyd, it may be well to state here the essential features of that system. Otto Salomon, in his book on the Theory of Educational Sloyd, thus explains it: "Sloyd is a system of Educational Handwork. In Sweden the

term Sloyd embraces many useful forms of handcraft, such as: work in wood, (carpentry, carving, fret work, and turnery); in metal, (brass, iron, and wire); leather; cardboard, and such occupations as brush making, coarse painting, straw plaiting, basket making, and book binding."

"The term Sloyd, in England, is generally understood to mean a system of Handwork in Wood. Why do we not then call it Carpentry? Because it differs from it in several essential features. There is no division of labour in Sloyd. Carpentry is a trade, and the principles which underlie it are entirely utilitarian, whereas Sloyd is solely a means of Formative Education."

"Its purpose is not to turn out Carpenters, but to develop the mental, moral, and physical powers of children; and it is the most effective instrument yet devised for securing this development."

"It gives a taste for rough labour as distinguished from clerical accomplishments; it cultivates manual dexterity, self-reliance, accuracy, carefulness, patience, perseverance, and especially does it train the faculty of attention and develop the powers of concentration."

"The methods employed in Sloyd are such as are best fitted to secure these ends."

"The objects which the child makes are equally useful with those of the carpenter; but, unlike the work of the carpenter, the value of the child's work does not exist in *them*, but in the *child* that made them."

The Sloyd system of Woodwork is developed through a series of objects technically termed Models. These begin with some exceedingly simple objects, such as printers, letter openers, labels, and the like. In the typical Sloyd course for boys at Nääs, there are fifty such Models, and thirty in the course for girls. They are so arranged that each represents some slight advance upon the one that preceded it in the course,—either some new tool, or some new use of a tool previously employed, being introduced in the making of it.

The utmost importance is attached to having each object, when made, the work of one individual pupil. Division of labor is rigorously excluded from the system; so much so, that whenever it is necessary for the teacher to show the pupil how any particular part of the work is to be done, he is to show this, not by doing a portion of the pupil's work for him, but by giving the demonstration upon another piece of wood. Self-reliance is one of the points of character to be developed by the system, and so the Sloyd model when completed must be, from beginning to end, the individual work of the pupil who made it.

GENERAL PRINCIPLES RELATING TO THE SERIES OF MODELS.

Salomon gives the following ten points on the choice of the model:

1. All objects of luxury—knick-knacks—should be excluded.
2. All Models should be serviceable in the house.
3. They should be capable of being finished by the children without help.
4. The Models should be of wood, and only wood should be worked in, as a rule.
5. The objects should not be polished or stained.
6. The objects made should be such as to require as little wood as possible.
7. The children should be taught to work in harder and softer kinds of wood.
8. Turnery and carving should be used very little.
9. Objects chosen should be such as will develop the sense of form.
10. All the exercises (embraced by the particular kind of Sloyd in question) which the child is capable of making, should be properly graduated and included in the series in due proportions.

Mr. Salomon also gives the following eight principles on the arrangement of the series of Models:

1. The series should proceed from the easier to the more difficult, and from the simpler to the more complex.
2. A refreshing variety must be afforded.
3. In the early part of the series, the models should be capable of being quickly and easily made, and should be so progressively arranged that, later on, the objects arrived at should require more time and skill, and yet be capable of being done without help.
4. In the production of the early models, few tools should be required, but as the series progresses, new tools and manipulations should be introduced.
5. That every model should be so placed in the series, that the necessary qualifications for doing it exactly are found in the child, who therefore does not need the help of the teacher.
6. The models must be so arranged that the pupils can always make not only a serviceable, but an exact copy.
7. That the knife—as the fundamental tool—be used frequently, especially at the beginning.
8. That generally in the early models the softest wood should not be used.

OUTLINES OF COURSES OF STUDY IN MANUAL TRAINING AND DOMESTIC ECONOMY.

For the purpose of showing the character of work attempted in manual training and domestic economy in the elementary schools in some foreign countries and in some of the cities in the United States, the following outlines of courses are submitted:

MEMORANDUM ON MANUAL INSTRUCTION UNDER THE MANCHESTER SCHOOL BOARD, MANCHESTER, ENGLAND.

In Manchester, manual instruction is taught in eighteen of the elementary day schools, and is given out of school hours.

Teachers.—The ordinary teachers connected with the schools teach the subject where possible, that is, where there are qualified teachers of manual instruction on the staff.

In some cases, the head masters themselves teach it.

The teachers of manual instruction have all been specially trained for the work by the superintendent of manual instruction.

Twenty boys form the maximum number for one teacher at a time.

Fittings.—The manual rooms are fitted with single benches; a room thirty-two feet by twenty-four feet gives sufficient space for twenty benches.

Cost of fittings.—A room fitted up with twenty benches and a complete set of tools costs altogether about two hundred and fifty dollars.

If only one group of boys use this room, the cost of fitting up per head would be about twelve dollars, but generally four to twelve groups use the room.

Cost of material.—The average cost per pupil for material including drawing material, is fifty-five cents per year.

Scheme of manual instruction.—The scheme of manual instruction is educational as opposed to technical.

It may be said to be based, in regard to the series of models, on an adaptation of the principles of Sloyd teaching to the best traditions of English workshop practice.

Class teaching is only employed in drawing and demonstration lessons.

The teaching at the bench is individual.

No assistance whatever is given to the student beyond the demonstration of proper methods of work.

A high standard of finish and accuracy is insisted upon, and in order to make this possible the models are carefully graduated both in regard to drawing and bench work.

The models when made and approved become the property of the student.

The method of instruction is by drawing, demonstration, and bench work.

Each boy makes a dimensioned drawing, in plan and elevation, of the object he has to make, in a book large enough to hold a year's work. The model is then made before him, and at the same time a simple account is given of the theory of the construction of tools, and the structure and growth of timber. The bench work is then all done from the boy's own drawing and notes, the teacher simply intervening occasionally to correct improper methods of work.

The course of instruction is arranged to cover three years.

CONDENSED PROGRAM OF MANUAL OCCUPATIONS FOR ELEMENTARY SCHOOLS, PREPARED BY MR. A. SLUYS, DIRECTOR OF THE BRUSSELS MUNICIPAL TRAINING COLLEGE, BELGIUM.

Lower Standard.

First Year.—1. Clay modeling—Sphere, cube, and other simple geometrical forms; objects of real life, such as fruits, etc. Original forms of beauty.

2. Pea-work—Construction of forms of two and of three dimensions; various forms of life and beauty.

3. Paper-folding and cutting—Geometrical forms of two dimensions; forms of life and beauty.

Second Year.—Revision and extension of work of first year.

Intermediate Standard.

Third Year.—1. Clay modeling — Extension of work of first and second year.

2. Cardboard work — Making geometrical forms of two and three dimensions in cardboard, with scissors, knife, and gummed paper. Ornamentation of objects made by means of coloured paper, so as to develop taste for harmony of colour.

Fourth Year.—1. Cardboard work — Cutting out and putting together more advanced applications of geometrical forms and useful objects, as pencil-box, match-box, etc. Ornamentation as before.

Higher Standard.

Fifth Year.—1. Cardboard work.— More advanced work.

2. Wood work.— Beginning of wood work. Copies of a graduated series of objects.

Sixth Year.—1. Cardboard work.— More advanced work.

2. Wood work.— Further graduated exercises. Dovetailing and mortice-work, with T square. Putting together of objects consisting of several parts.

KINDS OF MANUAL WORK TAUGHT IN PARIS.

The Paris program includes five distinct kinds of work, namely:

1. Paper work.
2. Cardboard work.
3. Modeling and moulding clay.
4. Wood work.
5. Iron work.

If the school has a work shop, the five kinds of work are gone through. If there is no work shop, only the first three kinds are done. Out of 190 elementary boys' schools in Paris, 123 are at present provided with work shops. Of these, however, only 32 have the necessary fittings for iron work, so that the rest work in wood only.

PROGRAM FOLLOWED.

The following is the manner in which the occupations are portioned out among the standards:

Elementary Standard.

(Age of pupils, 7-9.)

First Year.—*Paper cutting and folding.*—Lines, angles, squares, surfaces, easy figures of three dimensions. *Paper weaving.*—Various symmetrical designs.

Second Year.—Revision and extension of first year.

Intermediate Standard.

(9-11 years of age.)

First Year.—*Paper cutting.*—Triangles, polygons, with study of their geometrical properties. *Cardboard work.*—Regular solids, with applications. *Modeling in clay.*—Geometrical and ornamental figures in moderate relief.

Second Year.—Revision of first year's work. Commencement of *wood and iron work.*

Higher Standard.

(11-13 years of age.)

First Year.—*Cardboard work*—(where there is no wood or iron work.) *Modeling in clay.*—More advanced. *Wood and iron work.*

Second Year.—Same as first year.

In general, in wood and iron-work, there is no particular amount of work exacted for each year. The pupils do as much as they can; those who get on well, progress as fast as they are able. Twelve objects are, however, expected to be accomplished in a year.

The following manual training course for girls is taken from the report of the Superintendent of Public Instruction of the state of Michigan, for the year 1900.

"We give below a synopsis of a course of study for sewing, cooking and carpentry, selecting those features upon which there is a general agreement among educators. The work given for the kitchen is quite specific, but owing to lack of space, only a general outline is given."

MANUAL TRAINING COURSE FOR GIRLS.

Third Grade—(First Year Work.)

- | | |
|--------------------------------|------------------------------------|
| 1. Basting. | 6. Hemming. |
| 2. Running. | 7. Making work-bag. |
| 3. Stitching. | 8. Cutting and making under-waist. |
| 4. Running and back stitching. | 9. Stitching simple designs. |
| 5. Over casting (top sewing.) | |

Fourth Grade—(Second Year Work.)

- | | |
|----------------------|---|
| 1. French seam. | 7. Ruttonholes. |
| 2. Patching. | 8. Sewing on buttons. |
| 3. Gathering-plain. | 9. Drafting skirt patterns. |
| 4. Gathering-French. | 10. Cutting and making skirt. |
| 5. Stroking gathers. | 11. Additional work; aprons, skirts, under-waists, etc. |
| 6. Putting on bands. | |

Fifth Grade—(Third Year Work.)

- | | |
|----------------------|---|
| 1. Felling. | 8. Drafting patterns for some under garment. |
| 2. Gusset-making. | 9. Cutting and making the same. |
| 3. Hemstitching. | 10. Fancy stitching. |
| 4. Tucking. | 11. Additional work; night shirts, gowns, under-garments, drawers, shirt-waists, etc. |
| 5. Cloth darning. | |
| 6. Weaving. | |
| 7. Stocking darning. | |

Sixth Grade—(Fourth Year Work.)

- | | |
|--------------------------------|------------------------------------|
| 1. Review of pattern drafting. | 6. Basting and stitching the same. |
| 2. Sleeve. | 7. Finish seams. |
| 3. Collar. | 8. Tailor buttonholes. |
| 4. Waist. | 9. Loops and eyelets. |
| 5. Cutting the above. | 10. Sewing on hooks and eyes. |

Seventh Grade—(Fifth Year Work.)

(A)

Cooking.

- | | |
|--|--|
| 1. Discussion of— | (e) Make beef tea. |
| (a) What it is. | (f) Experiment with starch and flour. |
| (b) Effects upon foods. | 5. Make blanc mange. |
| 2. Fuel: wood, gas, coal. | 6. Make a salad—serve the same with vegetables or meat. |
| 3. Starting the fire. | 7. Boil potatoes; beets; onions; squash; etc. |
| 4. Boiling: | 8. Make vegetable soup. |
| (a) Note with thermometer changes of temperature of water. | 9. Boil oat meal—other cereals. Study cereals. |
| (b) Effects upon the white of an egg; of hot water; of continued boiling; of simmering. | 10. Boil rice; make custard. |
| (c) Study in similar manner effects upon fresh meat. Deduce that the proper temperature for cooking albumen is just below simmering point. | 11. Boil coffee, and cocoa. Study them. |
| (d) Experiment in similar manner with salted meats; smoked meats. | 12. Boil and bake macaroni. Study its manufacture. |
| | 13. Make corn starch pudding. Lessons on utensils used in cooking. |

(B)

Stewing:

Experiment with tough meats with and without acids — (lemon juice, etc.)

(C)

Broiling:

Study names and positions of steaks; selection of different meats. Toast bread. Make milk toast. Study utensils used in broiling.

(D)

Baking:

1. Experiment with yeast, soda, cream of tartar, sour milk, baking powder. Show in each the presence of carbonic acid. (Lighted taper extinguished.)
2. Distinguish soda from cream of tartar.
3. Make yeast. Discuss the yeast plant.
4. Make pop-overs, biscuits, muffins, cornbread, wheat bread, etc.
5. Bake meat; compare with broiled and boiled meat. Select best pieces; basting; solid and rolled roasts.

Eighth Grade — (Sixth Year Work)

1. Review of previous year's work.
2. Particular attention to pastry cooking.
3. Household economics:—
 - (a) Prepare menus for different seasons.
 - (b) Prepare menus for certain number of persons at stipulated cost for each.
 - (c) Comparison of cost of different menus.

OUTLINE OF COURSE OF STUDY IN MANUAL AND DOMESTIC ARTS AND SEWING, IN THE PUBLIC SCHOOLS OF BROOKLINE, MASS.

Kindergarten.

Gifts and occupations.

Grade I.

Selected Kindergarten occupations. Constructive work in connection with other studies.

Grade II.

Paper cutting and folding. Constructive work in connection with number, language and history.

Grade III.

Clay modeling and cardboard work.
Use of scissors. Short seams. Basting, stitching, back-stitching, running, hem felled, oversewing, over-casting, hems measured and finished. Supplementary work: Work-bag of checked linen.

Grade IV.

Knife work with wood of two dimensions.

Three-inch model of French seam. Mark name by stitching. Hemmed-on patch. Stitched-in patch. Supplementary work: White muslin apron with drawing string.

Grade V.

Advanced work with the knife and simpler tools.

Oversewed patch used on lighter cloth. Darning stockings. Making button-holes. Supplementary work: Cooking outfit for sixth year, to be cut and prepared by girls of higher grade.

Grade VI.

Mechanical Drawing. Models constructed from drawings with the use of all common tools.

General care of house; airing, sweeping, dusting, cleaning, care of beds, table setting, washing of dishes, care of fire, stove and lamps.

Make tuck-measure; fold cloth for tucks; make gusset measure; cut and sew gusset in end of seam; sew gathered piece into a waistband; button-holes and loops; sew on buttons with tape; whip and sew on ruffle; darning. Supplementary work: White cloth skirt.

Grade VII.

Mechanical drawing. Projections of geometric solids. Working drawings.

Advanced Sloyd and wood carving.

Water and its effect upon foods. Milk as a typical food. Fat in cooking. Experiments with albumen and starch. Cooking of eggs, vegetables and cereals.

Bind white cloth sampler with thirty-five different models of sewing. Supplementary work: Diagrams for undergarments drafted for measurements; study different qualities of cloth.

Grade VIII.

Mechanical drawing. Continue work of Grade VII. Design copied and original.

Wood turning.

Combinations of starch and proteid. Cooking of fish and meat, meat soups and gelatine dishes. Yeast bread. Baking-powder mixtures.

Study flannels of different weight and their adaptation to different uses. Materials for stockings. Gingham and muslins. Fine darning. Use of sewing machine. Supplementary work: Flannel skirt finished with slight embroidery; hemstitched undergarments; Mexican work; lace work.

Grade IX.

Mechanical drawing continued.

Bench work. Elementary cabinet making.

Canning of fruit and jelly making. Plain pastry cake, simple puddings, salads, frozen dishes. Invalid cookery.

Shirt waist cut and fitted and made on machine. Dress lining fitted by the "art of pinning on." Dress cut, fitted and made. Hooks and eyes. Sewing on of braid, etc. Millinery begun. Notes taken of all lessons.

COURSE IN MANUAL TRAINING IN THE SCHOOLS OF LOS ANGELES, CALIFORNIA.

FIRST YEAR — A AND B CLASSES.

MANUAL TRAINING — Clay Modeling — Conceptual modeling, illustrating subject under consideration, based upon a study of the true type form.

Paper-Cutting and Paper-Folding — To be used as aids in developing and making practical the subject taught. Emphasize the utilitarian side by producing articles both useful and attractive.

Weaving — Continue work of kindergarten leading to the production of useful articles by braiding, twisting and weaving strands of various kinds, such as vegetable fiber, palm, raffa, tape, cord, and the production of crude fabrics in cotton, wool or silk; and cardboard darning.

SECOND YEAR — A AND B CLASSES.

MANUAL TRAINING — Continue paper-folding and cutting. Introduce color, showing the tints and shades in reproducing fruits and flowers by teaching use of the brush. This to be used in connection with drawing.

THIRD YEAR — A AND B CLASSES.

CARDBOARD SLOYD — Models to be constructed: Ruler, triangle, square tray, oblong tray, note book, thread winder, tag, calendar, wall pocket, frame, equilateral triangle, needle case, portfolio, basket with handle, match strike, triangular box, circle-maker, circular mat, book-mark, bonbon box, slanting tray, handkerchief box, woven basket, square box and cover, 30-degree triangle, triangular tray, triangular box and cover.

FOURTH YEAR — A AND B CLASSES.

CARDBOARD SLOYD — B 4 classes will take the same work as third year. A 4 classes will construct the following models: Ruler, triangle, folded tray, note book, thread winder or tag, frame, equilateral triangular box, portfolio, envelope, bonbon box, triangular tray. Pulp-board covered memorandum card, calendar back, lined tray, note book covers.

FIFTH YEAR — B CLASS.

SEWING — Seven stitches on burlap. Talk on cloth. Weaving on card. Even, uneven basting and running stitch. Design outlined with fine running stitch. Striped calico matched and top sewed. Overcasting. Back-stitch, half-back and combination stitch. French seam on bleached muslin. Mitred and square corners, cut in paper; mitred and square corners cut on muslin. Bias matching; bias cut in paper.

FIFTH YEAR — B CLASS.

SEWING — Talk on needles. Make small bag. French hem on damask. Fine hemming on bleached muslin. Manufacture of spool cotton. French fell. Skirt opening, gathering and placing of bands. Apron. Flannel.

FIFTH YEAR — A AND B CLASSES.

SLOYD — *Model No. 1. Pencil-Sharpener* — New exercises: Measuring, length planing, cross-cut sawing, gluing. New tools: Smoothing plane, try-square, ruler, back-saw.

Model No. 2. Flower Label — New exercises: End planing, oblique planing, sand-papering. New tools: Block plane, bench hook, sand-paper.

Model No. 3. Key Tag — New exercises: Edge filing, boring. New tools: Flat file, brad-awl.

Model No. 4. Mat — New exercises: Turning sawing, spoke-shaving. New tools: Turning saw, spoke-shave.

Model No. 5. Twine Winder — New exercises: Filing concave curves. New tools: Half-round file.

Model No. 6. Match Scratcher — New exercises: Horizontal boring. New tools: Center bit, bit brace.

Model No. 7. Key-board — New exercises: Fixing metal fittings, metal filing. New tools: Metal file.

Model No. 8. Paper Knife — New exercises: Curve filing, modeling with spoke shave. New tools: Cabinet scraper.

Model No. 9. Key Rack — New exercises: Edge filing. New tools: Round file.

SIXTH YEAR — B CLASS.

SEWING — Tape, hooks and eyes. Button-holes and buttons. Hemmed patch. Top-sewed patch. Patch on flannel. Stocking darning. Darning on cashmere. Slip stitching. Talk on scissors, pins and thimbles. Tucks, plain and hemstitched.

SIXTH YEAR — A CLASS.

SEWING — Manufacture of silk. Pattern of white skirt, draughted to measure. Making small skirt.

SIXTH YEAR — A AND B CLASSES.

SLLOYD — FIRST COURSE — *Model No. 1, Pencil-Sharpener* — New exercises: Measuring, rip-sawing, jack-planing, gluing. New tools: Ruler, rip-saw, jack-plane, try-square.

Model No. 2, Label — New exercises: End planing, oblique sawing, oblique planing. New tools: Block-plane, bench-hook.

Model No. 3, Key-Tag — New exercises: Edge filing (convex), boring (horizontal), sand-papering. New tools: Flat file, bit brace, center bit, sand-paper.

Model No. 4, Table Mat — New exercises: Turning, sawing, spoke-shaving. New tools: Turning saw, spoke-shave.

Model No. 5, Fish-line Winder — New exercises: Edge filing (concave). New tools: Half-round file.

Model No. 6, Elliptical Cutting Board — New exercises: Modeling with spoke-shave. New tools:

Model No. 7, Key Rack — New exercises: Filing interior edges, fixing metal fittings. New tools: Brad-awl.

Model No. 8, Match Safe — New exercises: Filing compound curves, nailing. New tools: Hammer.

SECOND COURSE — *Model No. 1, Elliptical Cutting Board* — New exercises: Modeling with spoke-shave.

Model No. 2, Match Safe — New exercises: Filing compound curves, flush joints, nailing.

Model No. 3, Comb Case — New exercises: Free-hand curves; oblique flush joints.

Model No. 4, Easel — New exercises: Stippling, toe nailing.

Model No. 5, Picture Frame — New exercises: Making ellipse, beveling, with file.

Model No. 6, Bracket — New exercises: Compound curves.

SEVENTH YEAR — B CLASS.

COOKERY — *Preliminary Lessons* — Names, uses and care of utensils. Washing of dishes. Dusting a room. Measuring. Principles of combustion and fire-building. Boiling of water.

Study of Food Principles — (1) Carbohydrates: Starches and sugars: source, composition, effect of heat, digestibility: cost as compared with other foods. (2) Proteids: Eggs, milk and fish, studied under same topics as carbohydrates. (3) Fats and oils: same sub-topics. Dishes to be prepared, applying scientific principles already learned.

SEVENTH YEAR — A CLASS.

COOKERY — Study of food principles, continued:

Proteids — Meat. Study of various cuts. Methods of cookery: roasting, baking, boiling, broiling.

Batters and Doughs — Study of soda and cream of tartar; of yeast, of flour: the use of baking powder and yeast as methods of making batters and doughs light.

Beverages — Growth; preparation for the market; preparation for the table; food value.

SEVENTH YEAR — A AND B CLASSES.

SEWING — Same as sixth year.

SLOYD — *Model No. 1, Flower Stick* — New exercises: Mark gauging, whittling. New tools: Marking gauge, knife.

Model No. 2, Penholder — New exercises: Boring (perpendicular), curve whittling, peg fitting. New tools: Drill bit.

Model No. 3, Flower Pot Stand — New exercises: To joint a surface, nail setting. New tools: Winding sticks, nailset.

Model No. 4, Corner Bracket — New exercises: Smooth planing. New tools: Smoothing plane.

Model No. 5, Hammer Handle — New exercises: Modeling symmetrical curves, scraping. New tools: Cabinet scraper.

Model No. 6, Whisk Broom Holder — New exercises: Gouging. New tools: Gouge.

EIGHTH YEAR — B CLASS.

COOKERY — Canning and preserving. General cookery on lines followed in first year's work. Table setting and service. Bills of fare for breakfasts, lunches and dinners, cost estimated by pupils, and the meals actually prepared according to estimates. Cookery for the sick, with regard for correct dietetic value and dainty serving.

EIGHTH YEAR — A CLASS.

COOKERY — *Home Economics* — General household arrangements. Plumbing, heating and ventilating. Care of lamps and oil stoves. Care of beds and bedding. Cleaning of metals and woodwork. Removal of stains from household linen. Emergencies and home nursing.

EIGHTH YEAR — A AND B CLASSES.

MANUAL TRAINING — SLOYD — *Model No. 1, Nail Box* — New exercises: Flush joints, halving together joints. New tools: Chisel.

Model No. 2, Picture Frame — New exercises: Rabbeting, mitering. New tools: Rabbet plane, miter box.

Model No. 3, Towel Rack — New exercises: Clamping, countersinking, axle fitting, veining, stippling. New tools: Clamps, countersink, screw-driver, veiner, carver's punch.

Model No. 4, Frame — New exercises: Half-lapping joints, chip carving, grooving with chisel. New tools: Cornerfirmer.

SEWING — Same as fifth year.

PRESENT PRACTICE AND SUGGESTIONS.

From an examination of the foregoing courses, and others adopted in different cities in this and other countries, it will appear that the present practice in schools where the work in manual training is best organized, is to give work in paper cutting and folding, cardboard work and clay modeling in the primary grades; in the lower intermediate grades, cardboard work and clay modeling, and in the higher intermediate grades, Sloyd wood work for the boys, and sewing for the girls. In the grammar grade Sloyd wood work for the boys, sewing and cooking for the girls. Drawing should be carried on throughout all the grades, in connection with the other lines of manual training. The work in paper cutting and folding with cardboard, and the sewing, may be carried on in the ordinary school room, and with but little expense for tools and material.

For the introduction of Sloyd wood work, a room should be fitted up with benches and tools for the accommodation of twenty pupils. Such a room can be furnished at an expense of about three hundred dollars. It would also be necessary to have a room specially fitted up for carrying on the work in cooking. This would cost according to equipment, from three hundred and fifty to five hundred dollars. The rooms equipped for wood work and cooking could be used as centers to which pupils from different schools could come for reasonable distances, for instruction. Giving each class of twenty pupils a two hour lesson once a week, three hundred different pupils could be accommodated in each room, and each set of pupils taught by a single teacher. In organizing the work, it is not necessary to begin all the different lines at the same time. The work in the primary and intermediate grades could be begun with the least expense, wood working could next be started, so as to carry on the instruction begun in the lower grades, and finally an equipment and teacher should be added for the cooking.

Considering the value of manual training, it is evident that the moderate expense connected with the introduction into the schools presents no serious difficulty.

The normal schools should at once undertake the training of grade teachers so that they may be able to carry on the different lines of manual training which may be undertaken without special equipment and special rooms. If this training were undertaken in the normal schools, they could send out every year five hundred young women who could give instruction in these subjects. There should be in connection with some one of the normal schools, a department devoted to training teachers of cooking, and the various lines of domestic economy, and also teachers who could take charge of the wood working department.

In organizing work in manual training, too much emphasis cannot be placed upon the necessity for employing teachers who are thoroughly trained for doing the work successfully. The artisan is not a teacher.

MODIFICATIONS IN PRESENT COURSES MADE NECESSARY BY
THE INTRODUCTION OF MANUAL TRAINING.

One of the objections urged against the incorporation of manual training in the common school courses, is that these courses are already overcrowded, and that any additional work would make too great demands upon pupils' time and energy, and would result in a deterioration of the work now carried on. The Parliamentary Commission on Manual and Practical Instruction in Primary Schools under the Board of National Education in Ireland, after an exhaustive investigation reported upon this point as follows: "From witness after witness in England and in Scotland, we learn, as the result of the experience gained since the establishment of the classes of wood work and similar instruction, that the instruction given in these classes is productive of the various advantages already specified in connection with Hand and Eye training exercises in the Lower Standard." (The work in Hand and Eye training is that previously specified as adapted for the primary and lower intermediate grades.) "It trains and quickens the intelligence of the pupils. It teaches them, in many practical ways, the useful lesson of the importance of exactness, even in matters of apparently small detail. It gives a useful variety to the work at school. So far from injuriously affecting in any way the book

work of the school it tends on the contrary, to the greater progress of the pupils in that portion of their work. It is popular with the pupils, with their parents, and with the teachers. It has come to be popular even with teachers who at the outset were opposed to it, either from a misconception of its nature, viewing it as something connected with trades, and therefore out of place in an elementary school, or from an apprehension, not unnatural in the absence of all experience as to its working, that it would interfere with the book work of the school."

The London school board says: "It is usually found that the time deducted from the ordinary school hours of boys who are undergoing courses of manual training, in no way causes a decreased efficiency in the ordinary subjects. Boys are also found to be more careful and observant, more self-reliant, and certainly are more likely to grow up with a real respect for the dignity of labour."

A French commission who carefully investigated this subject in France, reported that in the judgment of its members if one-half of the children's time in school were devoted to manual training, as much and as good work in the ordinary subjects of study would be done in the remaining half as were then being done in the full time. The unvarying reports from schools in the United States where manual training has been introduced are of the same tenor. That this conclusion is a reasonable one, will be evident to any person who realizes that children in the graded schools can not possibly devote the whole of the six hours of school time daily to profitable study of books. The manual training comes as a rest and change and enables the pupil to do better book work than could be done without it.

Granting this conclusion to be true, the objection will be still urged that the present program occupies every moment of the day, and no place can be found for manual training. If superintendents and teachers will examine with care the purposes of their daily work in the school room, and see that these purposes are such as can be justified in a rational scheme of education, and will then limit the demands upon the pupil to what is absolutely necessary to the accomplishment of these purposes, it will be found that much of the work now

done may be eliminated as unessential. It will also be found that one or two lessons in almost any subject of the course may be omitted each week for any half year, without loss to the pupils. One-half the time now devoted to the study of arithmetic in the graded schools could be given up to manual training without any loss to the pupils, either in arithmetical knowledge or skill at the end of the course. When wood work is begun, the drawing in connection with it might take the place of the regular work in drawing without loss to the pupil. Where geography is carried on as a daily recitation as low as the third grade, this subject might very well be omitted for one or two periods a week without damage. These statements are made upon the assumption that each day has a definite purpose in each subject, and that definite work is assigned to pupils for preparation which is essential for the realization of this purpose.

OPINIONS OF UNIVERSITY PRESIDENTS.

The Manual Training Magazine for January, 1901, prints the testimonies of a number of university presidents as to the value of manual training to the young man. These testimonies were elicited by Mr. Julius Stern, a graduate of the Northeast Manual Training School of Philadelphia, and a student in the law department of the University of Pennsylvania.

With acknowledgments to the editor of the Manual Training Magazine these letters are here reprinted:

From the President of Harvard University.

ASTICOU, ME., October 2, 1900.

DEAR SIR: I should like to see some form of manual training made part of the education at school of every boy who is to come to college. It not only trains the eye and the hand, but develops the habit of accuracy and thoroughness in any kind of work. Moreover, it develops the mental faculties of some boys better than books do.

Sincerely yours,
(Signed) CHARLES W. ELIOT.

From the President of the University of Chicago.

CHICAGO, October 11, 1900.

MY DEAR MR. STERN: Complying with your request, I am glad to say that our experience in the schools connected with the University of Chicago leads me to the conclusion that manual training in due proportion in the elementary and secondary schools gives breadth and power which become an effective means in higher education. Nor is this true merely in the case of those who are pursuing courses in engineering; other things being equal, every young man and young woman is the better fitted for the higher work of the university for having trained hands, and the power to plan and execute which comes through manual training.

Yours very truly,
(Signed) WILLIAM R. HARPER.

From the President of Johns Hopkins University.

President Daniel C. Gilman, of Johns Hopkins University, refers Mr. Stern to his published article on "A Plea for the Training of the Hand," in which he says:

"Manual training is an essential part of a good education, whether that education is restricted to the common school or carried on to the highest discipline of technical schools and universities."

From the Provost of the University of Pennsylvania.

PHILADELPHIA, October 22, 1900.

DEAR SIR: It is to me no matter of surprise that manual training has taken so prominent a place in modern education. The increasing use of laboratory methods in professional schools is in recognition of the fact that no amount of didactic teaching can cover the whole ground in any of the sciences, and that mental concepts must have the aid of actual experimentations. If the service of the trained eye and trained hand is an essential to the mental grasp of the higher sciences, it cannot but be that the training of these organs will be helpful to mental activities of any kind. With a proper apportionment of time, I believe that manual training may be made a part of the curriculum of any school; and that, so far from hindering, it will actually advance the education of the student in other and more abstract directions.

Sincerely yours,
(Signed) CHAS. C. HARRISON.

*Manual Training in the Public Schools.**From the President of Lehigh University.*LEHIGH UNIVERSITY,
SOUTH BETHLEHEM, PA., October 9, 1900.

DEAR SIR: Our experience at Lehigh University with the graduates of the manual training schools of Philadelphia and other cities has been most favorable. The courses of instruction in these schools is an admirable preparation for engineering colleges. It is not merely that the boys have been taught the use of tools; it is rather that their minds have been trained through the medium of the eye and the hand. Desirable as it is to teach a boy the elements of handicraft, and useful as this accomplishment may be in after life, it is an entirely false idea of the purpose of manual training schools to suppose that this is the end aimed at. The education of a boy is the more complete and thorough the more avenues that are opened up for his enlightenment, and manual training, when systematically and intelligently carried out, gives the boy facts and thoughts which he would fail to get in the class-room.

(Signed) T. M. DROWN.

From the President of Cornell University.

ITHACA, N. Y., October 1, 1900.

DEAR SIR: In reply to your letter of September 28 I would say that I am a firm believer in an education which trains and develops the whole man. The hand is man's best servant, and some modicum of manual training should be included in the school training of every child of the present time.

Very truly yours,
(Signed) J. G. SCHURMAN.*From the President of the University of Michigan.*

ANN ARBOR, October 24, 1899.

DEAR SIR: The introduction of manual training into our high schools is rapidly and deservedly gaining favor in this part of the country. It is now recognized that it has a distinct and positive intellectual and pedagogical value.

Yours truly,
(Signed) JAMES B. ANGELL.*From the President of Leland Stanford Junior University.*

STANFORD UNIVERSITY, CAL., October 9, 1900.

DEAR SIR: I am in receipt of the catalogue of the Northeast Manual Training School of Philadelphia, and have examined it with much interest. I have always recognized the value of manual-training high schools, in which a good secondary education is given in connection with manual training. Such schools rise above the level of mere trade schools, and through their breadth of view, accompanied by practical drill, are doing a good work in America. We need more of them. Those interested in better education would not have such institutions take the place of the classical high school. They should rather develop side by side, and each should be equally open to all who can make use of their work. From this it follows that, if each is a good preparation for life, each is also a good preparation for college, and that the colleges and universities of the United States should recognize this fact in their entrance requirements.

We have a number of graduates from manual-training high schools among our students, and we find them fully capable of holding their own with the graduates of classical high schools.

Very truly yours,
(Signed) DAVID S. JORDAN.

From the President of the University of Wisconsin.

October 10, 1900.

DEAR SIR: I believe that every school which can afford to have a manual-training department will be profited by it in every way. The scholarship of the students need be in no way interfered with, and an interest will be created which is of sure value in after life.

Very respectfully yours,
(Signed) C. K. ADAMS,
President.

From the President of the University of Illinois.

CHAMPAIGN, ILL.

DEAR SIR: Replying to yours of the 27th ult. I will say that I have long been of the opinion that our educational work should give much larger recognition to industrial or manual training:

I think this remark applies to all of our work, from the primary to the university. I do not think that manual training is incompatible with intellectual development, but, on the contrary, that it promotes and supports healthful mental growth. I think it contributes to versatility, to contentment, to rational and productive living, and so to good citizenship; and accordingly that it should be recognized and helped on by all who have any interests in popular education, and particularly by all who have any share in the management of the public educational system of the country. I am,

Very truly yours,
(Signed) A. S. DRAPER,
President.

EQUIPMENT DESIRABLE FOR CARRYING ON THE INSTRUCTION
IN WOODWORK AND DOMESTIC ARTS.

The following lists have been prepared by request. It is hoped that they may be of value to those interested in organizing work in manual training and domestic arts in connection with the public schools. While not everything given in these lists is absolutely necessary to begin the work, they present what may be regarded as a desirable equipment. It will be observed that in most cases the cost of benches, tables, and furnishings, is high. In many cases these may be furnished by local manufacturers at much lower rates, thus materially reducing the cost.

LIST OF TOOLS FOR SLOYD WORK.

- 12 Toles double bench and vise.
- 6 22" Disston rip saws.
- 6 18" Disston hand saws.
- 12 10" Disston back saws.
- 4 14" turning saws.
- 12 coping saws with 1 doz. extra blades.
- 24 No. 3 iron smooth planes.
- 24 No. 5 iron jack planes.
- 12 iron spoke shaves.
- 24 No. 12 8" try-squares.
- 1 8" Tee bevel.
- 24 No. 65 marking gauges.
- 24 pr. 6" B. & C. dividers.
- 24 No. 1 2' rules.
- 12 $\frac{1}{4}$ " Buck Bros. chisels.
- 12 $\frac{1}{2}$ " Buck Bros. chisels.
- 12 $\frac{3}{4}$ " Buck's gouges.
- 2 8" adj. braces.
- 1 set R. Jennings's auger bits $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ".
- 12 asstd. center bits, $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", $\frac{7}{8}$ ".
- 6 asstd. gimlet bits.
- 2 Buck Bros.' countersinks.
- 1 No. 1 hatchet.
- 3 B & G hammers.
- 3 rubber mallets.
- 2 B & G 4" screw drivers.
- 2 knurled nail sets.
- 12 10" wood files and handles.
- 1 saw file and handle.
- 1 rat tail file and handle.
- 6 handled brad awls.
- 3 $\frac{1}{2}$ Rd. cabinet scrapers.
- 3 Swan-neck cabinet scrapers.
- 2 No. 12 oilers.
- 2 mounted oilstones.
- 1 mounted grindstone.
- 12 Sloyd knives.
- 12 wood carving knives.
- 3 carvers' punches.
- 12 whisk brooms.
- 12 3", iron clamps.
- 2 doz. 45° triangles No. 2013, 7 $\frac{3}{4}$.
- 2 doz. 30°x60° triangles No. 2012, 9.
- 2 doz. T squares No. 2079, 24.
- 1 box tacks No. 2446.
- 2 doz. rulers No. 1630.
- 2 doz. Sper comp.
- 1 ream drawing paper No. 10, 15/20.
- 1 set drawing of models.

The above list of tools and equipment for Sloyd work was prepared by Miss Anna Murray, Director of the Chicago Sloyd School.

The list furnishes an equipment for twenty-four pupils, and will cost about \$475 of which \$270 is estimated as the cost for benches. Benches at lower cost can be secured if desired.

EQUIPMENT FOR MANUAL TRAINING CENTERS FOR WOOD-
WORK.

For a Class of 24 Pupils.

6 Benches for four pupils with Sheldon vises.....	\$138 00
24 Acme bench stops	12 00
1 Grindstone	10 00
24 Jack planes No. 5 Bailey, at \$1.53.....	36 72
8 Smooth planes No. 2 Bailey, at \$1.22.....	9 76
20 Blades for No. 5 planes, at 20c.....	4 00
10 Blades for No. 2 planes, at 20c.....	2 00
12 Back saws Bishop with etching, at 86c.....	10 32
6 Panel saws Bishop with etching, at \$1.36.....	8 16
6 Rip saws Bishop with etching, at \$1.50.....	9 00
3 Turning saws 14", at 90c.....	2 70
3 Turning saws 12", at 90c.....	2 70
6 Turning saw blades 14", at 14c.....	84
6 Turning saw blades 12", at 14c.....	84
6 Hammers, at 35c.....	2 10
12 Rubber mallets, at 75c.....	9 00
3 Common bit braces, at 75c.....	2 25
1 Set Jennings auger bit	4 00
6 Dowel bits 1¼" and 3¾", 2½", at 20c.....	1 20
2 Countersinks, at 20c.....	40
2 Screw driver bits, at 10c.....	20
2 Oilers, at 10c.....	20
2 ½" Chisels, at 40c.....	80
6 ¼" Chisels, at 40c.....	2 40
6 ⅝" Chisels, at 45c.....	2 70
24 1" Chisels	13 20
12 ⅞" Gouges (regular), at 40c.....	4 80
6 Common spokeshaves, at 25c.....	1 50
3 Gooseneck scrapers, at 20c.....	60
6 Straight cabinet scrapers, at 20c.....	1 20
24 Ebony line "T" squares	6 00
24 Ebony 45° triangles	6 00
2 Ebony 30° triangles, at 25c.....	50
24 Drawing boards, at 50c.....	12 00
24 Compasses, at 40c.....	9 60
12 Rubber erasers, at 8c.....	96
1 Blackboard compass, Haustin's patent	1 25
2 Gross thumb tacks, at 15c.....	30
12 Drawing rules, at 5c.....	1 20
3 1" Varnish brushes, at 21c.....	63
3 Varnish cups, at 23c.....	69
3 1½" Varnish brushes, at 23c.....	96
1 Slip stone, at 10c.....	10
6 Wachita oil stone, at 50c.....	3 00
24 Try squares, special, at 25c.....	12 00
1 "T" bevel	30

24	Rules 2 ft.; four fold, at 10c.....	2 40
24	Marking gauges, at 25c.....	6 00
6	Dividers, B & O, at 32c.....	1 92
6	Screw drivers, 7", at 25c.....	1 50
6	Nail sets, various sizes at 10c.....	60
12	Chip carving knives, at 20c.....	2 40
25	Whittling knives, Osborne, at 25c.....	6 25
4	Flat files, 8", at 20c.....	80
6	Half round files, 8", at 20c.....	1 20
1	Saw file	10
1	Bit file	15
1	File card and brush	25
6	Coping saw frames, at 20c.....	1 20
3	Doz. coping saw blades	36
12	Carving punches (6 squares and 6 half squares).....	1 80
6	Wood hand screws, No. 6, at 50c.....	3 00
6	Wood hand screws, No. 10, at 50c.....	3 00
24	Bench hooks, at 25c.....	6 00
1	Locker case	25 00
6	Counter brushes, at 50c.....	3 00
6	Whisk brooms, at 15c.....	90
24	Portable adjustable vises	36 00
		\$453 12

The above list was prepared by Robert M. Smith, Supervisor of Manual Training in Chicago.

Some reduction can be made in this list if absolutely necessary, reducing the cost to about \$300.

EQUIPMENT FOR SCHOOL KITCHEN.

The listing that follows is for a school kitchen that will accommodate classes of sixteen and includes only the necessary equipment to work the classes according to the group method.

The prices quoted are prices obtained from reliable furnishing houses on wholesale lots.

The general furnishings, including tables and cupboards, may be purchased at wholesale or made to order. Ready made furniture is less expensive and less satisfactory than that made to order. The list includes prices on both.

GENERAL FURNISHINGS.

1	Table for teacher (made to order) at \$10.00.....	\$10 00
4	Tables (drawers, cupboards, cutting and mixing boards), at \$25.00.....	100 00
9	Tables (bought of furnishing store) at \$6.00.....	54 00
	Extra hard wood tops, at \$2.00.....	18 00

1 Large steel range, from \$30.00 to.....	40 00
1 Refrigerator	12 00
1 Porcelain sink
1 Large cupboard for utensils (made to order).....	30 00
1 Large cupboard for supplies (made to order).....	30 00
1 Large cupboard for utensils (made to order).....	10 00
1 Large cupboard for supplies (made to order).....	10 00
1 Wood-box	2 00
1 ½ doz. stools, at 50c.....	3 00
1 Step-ladder	2 00
5 Small gas stoves, at \$2.00.....	10 00
1 Garbage can	1 00
1 Ash can	75

TINWARE.

1 Coffee can	\$0 08
1 Tea canister	06
6 Pie pans, at 3c	18
6 Washington pie pans, at 5c.....	30
6 Royal sifters, at 10c.....	60
1 Milk strainer	10
6 Roll pans, at 25c.....	1 50
12 Bread stick pans (Russian iron), at 30c.....	3 60
6 Brick loaf pans (Russian iron), at 20c.....	1 20
6 Brick loaf pans (tin), at 10c.....	60
4 Round loaf cake pans with tubes, at 25c.....	1 00
1 Angel cake pan	32
2 Sets of layer cake pans, at 12c.....	24
1 Fish rack	10
2 Bread raisers, at 40c.....	80
6 Small dripping pans (sheet iron), at 25c.....	1 50
2 Medium dripping pans (sheet iron), at 40c.....	80
2 Large dripping pans, at 60c.....	1 20
9 Long-handled skimmers, at 3c.....	27
1 Plain skimmer	01
6 No. 2 graters, at 18c.....	1 08
6 Nutmeg graters, at 2c.....	12
2 Doz. muffin rings, at 10c.....	20
5 Sets of muffin pans, at 14c.....	70
1 Ginger bread sheet	15
5 Apple corers, at 2c.....	10
9 Biscuit cutters, at 1½c.....	15
9 Cookie cutters, at 1c.....	09
9 Doughnut cutters, at 2c.....	18
5 Dish drainers, at 15c.....	75
2 4-gal. lard cans, at 30c.....	60
9 Graduated measuring cups, at 9c.....	81
2 2-qt. pails, at 3c.....	06
1 6-qt. pall	11
6 Flour dredgers, at 2½c.....	15
6 Pepper boxes, at 1½c.....	09
6 Salt boxes, at 1½c.....	09
1 Pint funnel	02
1 2-qt. funnel	04
1 Jelly funnel	04
½ Dozen ice cream bricks, at \$2.25 per doz.....	1 13
9 No. 30 gravy strainers, at 4c.....	36
1 Squash strainer	20

1 Doz. assorted tin covers	45
1 Brown bread mold	1 65
1 Melon mold	45
1 Turk's head mold	35
1 Dust pan	20
1 No. 8 steamer	12
1 Double roaster	60
1 Turkey roaster	75
1 No. 3 steam cooker	1 90
1 Cake box	3 50
1 Washing boiler (copper bottom)	1 30
2 Ten pound sugar boxes, at 37½c.	75
1 Bread box (japanned)	60
3 Large flour boxes (japanned), at 42c.	1 26
1 Spice case (japanned)	45
2 Large trays (japanned)	1 40
2 Small trays (japanned), at 50c.	1 00

IRONWARE.

5 Chopping knives, at 10c.	50
1 Enterprise meat cutter	2 25
1 Meat cleaver	50
1 Set of kitchen scales	2 20
9 Small sheet iron frying pans, at 10c.	90
2 Medium sheet iron frying pans, at 25c.	50
1 Large sheet iron frying pan	45
2 Waffle irons, at 65c.	1 30
6 Small griddles, at 15c.	90
6 Gem irons, at 17c.	1 02
9 Dover egg beaters, at 6c.	54
6 Pan cake turners, at 6c.	36
1 Can opener	05
1 Set of flat irons	70
1 Ice pick	08
1 Match safe	25
1 Ice chisel	12
1 Cork screw	12
1 Kitchen saw	26
1 Coffee mill	1 00
1 Frying pan and basket	1 75
3 Corn cake pans, at 17c.	51
5 Silver fruit pressers, at 25c.	1 25
1 Sink scraper, at 14c.	14

GRANITE WARE.

9 No. 2 Berlin sauce pans, at 20c.	1 80
1 No. 03 Berlin sauce pans	27
1 No. 04 Berlin sauce pans	35
9 No. 52 rice boilers, at 35c.	3 15
1 No. 54 rice boiler	58
9 Lipped sauce pans, at 10c.	90
1 3-qt. preserve kettle	17
1 5-qt. preserve kettle	25
9 2-pt. pudding pans, at 9c.	81
9 3-pt. pudding pans, at 10c.	90

2 3-qt. pudding pans, at 14c.....	28
9 Pint measures, at 16c.....	1 44
2 1-qt. measures (graduated), at 21c.....	42
6 Pie plates, at 9c.....	54
2 2-qt. dippers, at 17c.....	34
9 13-in. basting spoons, at 7c.....	63
2 Colanders, at 25c.....	50
9 10-qt. dish pans, at 32c.....	2 88
5 Soap dishes, at 17c.....	85
1 Oblong baking pan	36
1 Coffee pot	50
1 Tea pot	35

ENAMEL WARE.

12 Assorted molds, at 20c.....	2 40
9 Soup ladles, at 20c.....	1 80
6 3-qt. water pitchers, at 90c.....	5 40
1 Oval baking pan	40
3 Round mixing bowls, at 50c.....	1 50
9 5-inch pudding pans, at 18c.....	1 62
9 6-inch pudding pans, at 20c.....	1 80

WIRE WARE.

2 Frying baskets, at 15c.....	30
9 No. 3 light broilers, at 10c.....	90
6 Potato mashers, at 10c.....	60
9 Surprise egg beaters, at 2c.....	18
1 No. 1 tea strainer	15
6 No. 2 tea strainers, at 20c.....	1 20
9 Bowl strainers, at 10c.....	90
1 No. 4 extension strainer	46
6 Pot cleaners, at 4c.....	24
6 Meat forks, at 4c.....	24
6 Small wire toasters, at 5c.....	30
6 No. 2 dish drainers, at 38c.....	2 28
1 Sink basket	15

CUTLERY.

2 Doz. large steel knives, at \$1.25.....	2 50
2 Doz. steel forks, at \$1.25.....	2 50
2 Doz. vegetable knives, at \$1.00.....	2 00
1 10-inch butcher knife	45
1 Carving set	2 00
1 Bread knife	1 00
1 Set Christy knives	1 20
1 Doz. spatules	3 50
1 Set of larding needles	50
1 Emery knife sharpener	12

PORCELAIN WARE.

1	1-qt. pitcher	14
1	2-qt. pitcher	20
12	Individual baking dishes, at 8c.....	96
9	2½ qt. mixing bowls, at 10c.....	90
1	8-qt. mixing bowl	50
9	1-pt. bowls, at 8c.....	72
9	1-qt. bowls, at 12c.....	1 08
18	Egg cups, at 4c.....	72
18	Dinner cups, at 4c.....	72
24	Dinner saucers, at 5c.....	1 20
24	Dinner plates, at 6c.....	1 44
24	Pie plates, at 5c.....	1 20
3	Platters, No. 8, No. 10, and No. 12.....	63
2	1-gallon stone jugs, at 9c.....	18
2	2-gal. stone jars, at 18c.....	36
1	Quart bean pot	25
12	Spice jars, at 5c.....	60

GLASS WARE.

24	Jelly glasses, at 18c. per doz.....	36
12	One-pint Mason jars, at 45c. per doz.....	45
12	One-quart Mason jars, at 50c. per doz.....	50
12	Candy jars	1 50
9	Half-pint measuring glasses, at 7c.....	63
1	Lemon juicer	08
1	Pastry pin	35
1	Dairy thermometer	35

WOODEN WARE.

12	Slotted mixing spoons, at 8½c.....	1 00
12	Pastry spoons, at 8c.....	96
12	Rolling pins (holly), at 24c.....	2 88
6	Potato mashers, at 3c.....	18
5	13-inch chopping bowls, at 12½c.....	63
1	8-qt. freezer	3 15
1	Potato slicer	67
1	Pair butter spades	10
1	Butter ladle	08
1	Butter print	14
1	Salt box	22
1	Knife box	55
1	Spice mill	50
1	Scouring outfit	25
1	Pressing board	1 00

SILVER WARE.

2	Doz. German silver teaspoons, at \$1.00.....	2 00
2	Doz. German silver tablespoons, at \$2.00.....	4 00
1	Doz. forks	2 00
1	Doz. knives	2 50

LINEN.

2 Doz. dish towels	4 50
2 Doz. hand towels	3 50
1 ½ Doz. dish cloths	90
2 Doz. napkins	3 00
2 Table cloths	4 00
6 Tray cloths	3 00
Dusting cloths, holders, etc.	1 50

MISCELLANEOUS.

6 Asbestos mats, at 3c.	18
6 Dish mops, at 8c.	48
6 Soap shakers, at 8c.	48
2 Market baskets, at 10c.	20
1 Hamper	75
1 10-inch soap stone griddle	45

 \$536 29

This list of the equipments of a School Kitchen was prepared by Miss Laura G. Day, Director of Domestic Arts in the Stout Manual Training School, and involves good judgment as to what should be included and careful estimates on the cost. Some deviation is no doubt allowable. A less complete outfit might answer but it is not advisable to get along with less if means are at hand for supplying the full list.

The number of pupils provided for is sixteen. Computations may readily be made for classes of a different number. The class ought not to exceed twenty.

I. EQUIPMENT FOR BENCH WORK IN WOOD.

For 24 Pupils.

TOOLS KEPT IN THE TOP DRAWER OF THE BENCH.

12 Double benches of maple, plain tops and drawers.....	\$360 00
24 26" Simmons' or Disston's rip saws, 7 teeth.....	25 00
24 26" same, in cross cut saws	25 00
24 12" same, in back saws	25 00
24 24" Stanley stick rules	2 40
24 Sets Buck Bros.' or Butchers' socket firmer chisels, ¼-1"	60 00
24 No. 12 Maydole claw hammers	9 00
24 8" Stanley iron try squares	4 60
24 10" same, bevells, No. 18	6 40

24 8" same gauges	3 60
24 8" Drivewell screw drivers, No. 725	3 50
24 14" Bailey iron jack planes	34 00
24 Round mallets, 3"x5", No. 1.	2 00
24 8" Cook's dividers No. 2, one leg removable	13 00
24 1-lb. Wachita oil stones	12 00
24 Scratch awls with handles	2 00

TOOLS FOR GENERAL USE.

6 12" sweep, Spofford braces	6 00
6 Sets of R. Jennings' auger bits, $\frac{1}{4}$ to 1", by eighths	15 00
1 Clark's extension bit, $\frac{3}{4}$ " to 3"	1 00
12 Bailey's iron spoke shaves	2 00
6 6" steel cabinet scrapers, 3"x6"	1 20
6 6" rose reamers, square shanks	1 50
6 Brass oil cans	1 00
3 Sets of No. 42 Buck Bros.' or Butchers' gauges, beveled outside	15 00
1 Set same, beveled inside	5 00
2 Hand heaving axes	2 00
12 10" Nicholson's half round rasps	3 00
12 10" same of files	2 00
12 10" same of square files, one safe edge.....	2 50
12 Square shank twist drills, $\frac{1}{8}$ to $\frac{1}{4}$ ".....	2 00
	<hr/>
	\$646 70

II. EQUIPMENT FOR MECHANICAL DRAWING.

For 24 Pupils.

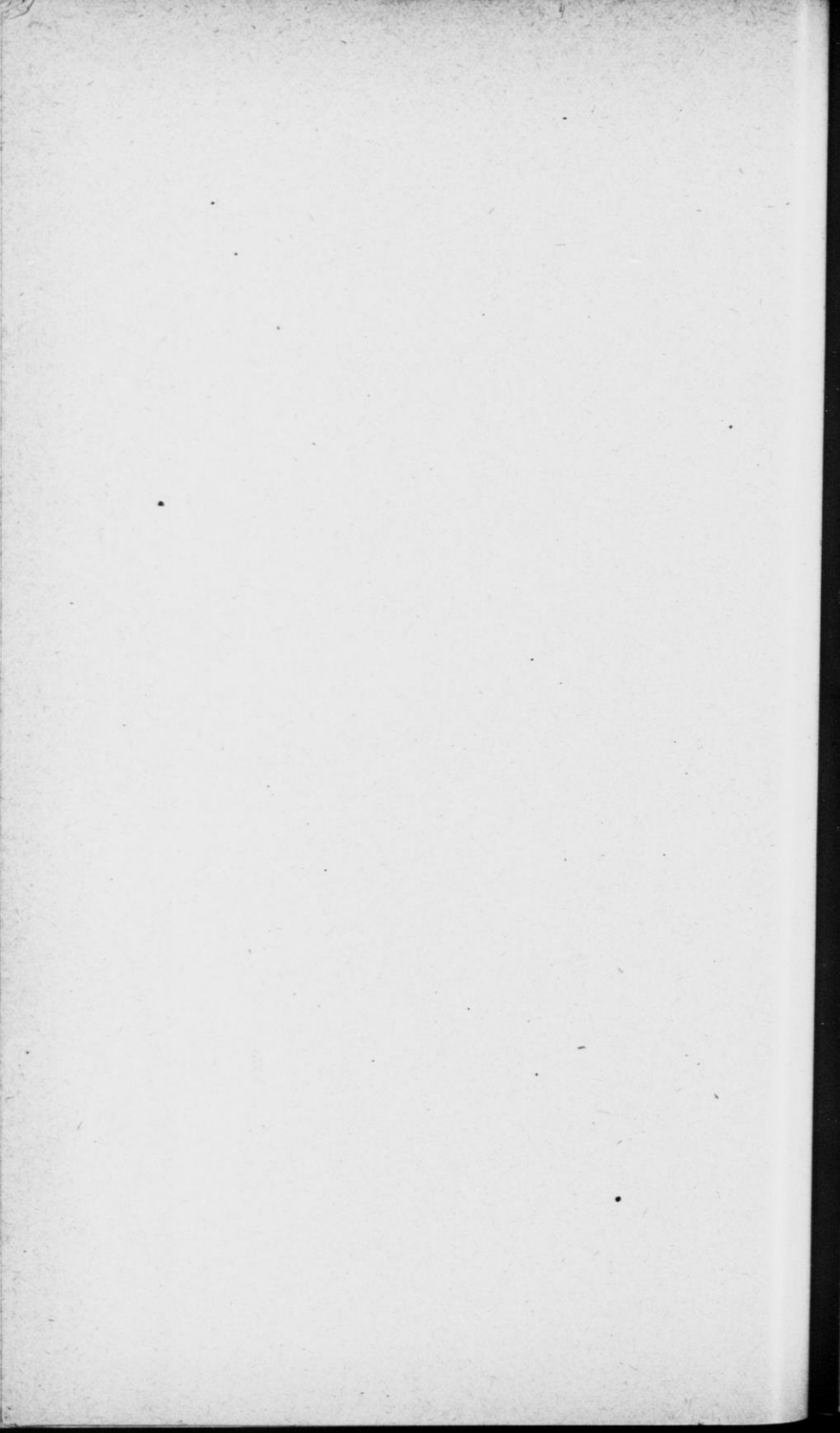
24 Special drawing tables, to accommodate eight pupils, tools and boards	\$360 00
24 Drawing boards of pine, 26" by 32".....	12 00
24 Micrometer head tee squares	36 00
24 Cases of drawing tools, "Technology set," Watson's, Chicago	144 00
24 8"—45' black rubber triangles	10 80
24 8"—30/60', same	7 20
24 4"—45' celluloid triangles	7 20
24 4"—30/60' same	3 12
24 Hard rubber curves, elliptical	8 16
24 Same, spiral	12 00
24 Box wood triangular scales	18 00
24 Bottles of Higgins' general liquid India ink.....	4 80
1 Ream of German universal drawing paper	4 50
2 Boxes of thumb tacks	1 00
1 Box hard lead pencils	1 50
	<hr/>
	\$630 28

III. EQUIPMENT FOR WOOD TURNING.

For 12 Pupils.

12 Wood turning lathes, Putnam, Reed or Vandervoort...	\$600 00
12 Sets tools of gauges and chisels, Buck Bros.' or Butchers'	76 80
12 Parting tools, No. 18, $\frac{1}{8}$ "	6 00
12 8" dividers, winged	3 50
12 8" outside winged calipers	2 94
12 Foot rules	1 20
12 Whisk brushes	2 00
12 Wachita slip stones	2 40
12 Wachita oil stones	6 00
	<hr/>
	\$700 84

The above list of equipment needed for manual training in the mechanic arts lines, was prepared by Mr. F. W. Kendall, Director of Mechanic Arts in the Stout Manual Training School, Menomonie, Wis. The prices are based upon estimates supplied by hardware dealers at the time of equipping the Stout Manual Training School. This school is one of the best equipped in the United States, both as to quantity and quality of material. The list is presented as showing the expense for first class equipment for a manual training school, and not as indicating what is necessary for the equipment of a single room for wood work, adapted to the needs of elementary school.



OFFICE OF
State Superintendent,
MADISON, WIS.

**Proposed Constitutional Amendment Relating to the Office of
State Superintendent.**

The following proposed amendment to the Constitution of Wisconsin was agreed to by the legislatures of 1899 and 1901. Chapter 258, laws of 1901, provides that the amendment shall be submitted to a vote of the people of the state at the next general election, in November, 1902.

"PROVISIONS OF AMENDMENT. Section 1. The supervision of public instruction shall be vested in a state superintendent and such other officers as the legislature shall direct; and their qualifications, powers, duties, and compensation shall be prescribed by law. The state superintendent shall be chosen by the qualified electors of the state at the same time and in the same manner as members of the supreme court, and shall hold his office for four years from the succeeding first Monday in July. The state superintendent chosen at the general election in November, 1902, shall hold and continue in his office until the first Monday in July, 1905, and his successor shall be chosen at the time of the judicial election in April, 1905. The term of office, time and manner of electing or appointing all other officers of supervision of public instruction shall be fixed by law."

Importance of the Office of State Superintendent.

The proper administration of the office affects the interests of nearly a half million pupils in the public schools. The state superintendent comes into official relations with more than 20,000 school officers and with the 13,000 teachers of the common schools. He passes upon the qualifications of the 700 high school teachers, and of the 750 teachers in the state graded schools. The proper discharge of his duties directly affects the character of the work done in the schools of the state, for the maintenance of which \$7,000,000 are expended annually, and in which nearly one-fourth of the entire population of the state are receiving instruction for not less than seven months each year.

Work of the Office Professional and Executive, Not Political.

It is the only state office requiring constructive and organizing work. This work must be carried on continuously and intelligently in order that the school system may keep pace in improvement with changing conditions, and with the necessities of the people. The state superintendent is called upon for information and advice in all matters relating to school legislation, and to the administration of the school laws. His various duties bring him into close official relations with people of all political opinions, and in matters which should be decided without reference to political bias.

Office Should Be Upon the Same Plane as the Judiciary.

Of all the offices in the state government, it is the one which should be entirely free from political influences or bias. For this reason this officer should be chosen because of his professional and administrative ability in educational work and not because of his political belief. This office should be put upon the same plane as the judiciary, where men are elected because of their fitness, and at the spring election, when no political issues divide parties.

The proposed amendment aims to take this office out of politics by putting the election in the spring, at the same time the judges are elected.

The State Superintendent should be Required by Law to Have Educational Qualifications.

The amendment gives the legislature the power to fix the qualifications of the state superintendent. He is not now required to hold even a third grade certificate. At the present time he is required by law to issue all certificates to high school teachers, and to county superintendents. County superintendents are required by law to have an educational qualification to be eligible to the office, while the state superintendent may be a man who could not qualify either as a high school teacher or as a county superintendent.

The Legislature Shou'd Have Power to Fix the Powers, Duties, and Compensation of This Officer, as in the Case of All Other Administrative Officers.

The amendment gives the legislature the power to determine and fix the powers, duties, and compensation of this officer, as is done in the case of the other administrative officers of the state government, the Secretary of State, State Treasurer, Attorney General, Insurance Commissioner, and Railroad Commissioner.

Should Enter Upon his Duties at Opening of School Year.

The amendment provides that the state superintendent shall enter upon the duties of his office at the opening of the school year. At the present time he comes into office at the same time the legislature convenes, with no experience in the administration of the school laws, and as may well happen with little or no knowledge of the laws in existence, or any definite ideas as to needed changes in the laws. He thus finds himself unable to give information and advice to members of the legislature who may seek such information or advice as to legislative matters pertaining to education.

Term of Office and Mode of Selecting Other Officers of Public Instruction Should be Controlled by the Legislature as in the Case of Other Officers.

The amendment also provides that the term of office, time and manner of electing or appointing all other officers of supervision of public instruction shall be fixed by law, which is exactly what is done in the case of all other offices, state or local, which are not constitutional offices.

The representatives of the people in the legislature may safely be trusted to perform the duties devolving upon them by this amendment, and in the interests of the people whom they represent.

This circular is sent out in order to call the attention of the people to this important amendment, and to inform them fully of its provisions. It is in no sense a political measure. Of the one hundred and thirty-three members of the legislature, but two voted against it in 1899, and in 1901 but three voted against it. A favorable vote upon the amendment is of the most vital importance to the educational interests of the state.

L. D. HARVEY,
State Superintendent.

14

State Historical Society
OF WISCONSIN,
MADISON. - WIS.

STATE OF WISCONSIN

Examinations for Teachers' State Certificates and for the County Superintendent's Certificate.

1902.

Times and Places.—The examination for teachers' state certificates will be held as follows for 1902:

August 12, 13, 14, 15, 1902, High School Building, Madison.

December 29, 30, 31, 1902, and January 1, 1903, High School Building, Madison.

The examinations for County Superintendent's Certificates will be held as follows:

June 30 and July 1, 2, 3, 1902, Ryan High School Building, Appleton, Wis., at the High School Building in Eau Claire, Wis., and the High School Building in Madison.

August 12, 13, 14, 15, 1902, High School Building, Madison.

December 29, 30, 31, 1902, and January 1, 1903, High School Building, Madison.

Board of Examiners.—Supt. C. F. Viebahn, Watertown, Chairman; Albert Hardy, Platteville; Dr. J. W. Stearns, Madison.

Reports.—As soon as practicable after the examinations, the standing of applicants will be determined and reported to the State Superintendent, and a statement giving results of such examinations will be sent from his office to each candidate. Notice of omissions or apparent errors should be addressed to the State Superintendent.

Concessions.—The requirements of the examiners are absolute, and no material modifications thereon should be asked in individual cases.

Stationery.—Stationery needed will be furnished by the Board of Examiners.

Character of the Examinations for Teachers' State Certificates.—The following list shows the branches in which candidates will be examined. The minimum standing required in each branch is 65, and the minimum average standing required for a certificate is 75.

I. ELEMENTARY BRANCHES required for the limited (five years) certificate: Reading, orthoepy, orthography, writing, English grammar, arithmetic, geography, U. S. history, algebra, geometry, civil government, theory and art of teaching, physiology, physics, English literature (historical), mental science, manual of the course of study for common schools, elements of agriculture, American and English literature, English composition and English history.

II. ADVANCED BRANCHES required in addition to the preceding for the unlimited certificate: Botany, zoology, political economy, general history, history of education, *geology, *chemistry, *astronomy, †English literature (critical), †Latin.

Experience—Moral Character.—To obtain the limited certificate, the candidate must have taught successfully at least twelve months; and to obtain the unlimited certificate, he must have taught successfully at least twenty-four months. Satisfactory evidence of moral character and successful teaching are required for which the candidate must furnish to the Board acceptable references.

Time Limits.—Candidates for limited certificates will be allowed trials at three consecutive sessions of the Board of Examiners in which to complete the examination; but if three trials are taken, the standings obtained previous to the third trial must be above the minimum average, or must be brought up by re-examination at the third trial.

Candidates holding the limited certificate will be allowed trials at any two consecutive sessions of the Board of Examiners during the validity of the certificate held, in which to complete the examination for a life certificate. Candidates for the life certificate who hold normal school certificates, will be required to pass examinations in algebra and geometry in addition to the studies listed under II.

Within the times herein fixed, re-examinations will not be required upon branches in which a satisfactory standing has been attained.

Persons who hold a county superintendent's certificate may within one year from its date secure a limited state certificate by passing the examinations in English Literature and Mental Science.

Selecting Examinations.—Candidates are advised not to attempt to pass all the examinations at one session, but to distribute their work so as to write in not more than one branch in any half day. That this may be done, the program of examinations remains unchanged from year to year.

Suggestions for Preparation.—For the guidance of those who desire to review any of the studies before examination, or are making original preparation in these branches, the follow-

*The candidate may elect any one of these three branches.

†The candidate may elect either of these branches.

The State Superintendent should be Required by Law to Have Educational Qualifications.

The amendment gives the legislature the power to fix the qualifications of the state superintendent. He is not now required to hold even a third grade certificate. At the present time he is required by law to issue all certificates to high school teachers, and to county superintendents. County superintendents are required by law to have an educational qualification to be eligible to the office, while the state superintendent may be a man who could not qualify either as a high school teacher or as a county superintendent.

The Legislature Shou'd Have Power to Fix the Powers, Duties, and Compensation of This Officer, as in the Case of All Other Administrative Officers.

The amendment gives the legislature the power to determine and fix the powers, duties, and compensation of this officer, as is done in the case of the other administrative officers of the state government, the Secretary of State, State Treasurer, Attorney General, Insurance Commissioner, and Railroad Commissioner.

Should Enter Upon his Duties at Opening of School Year.

The amendment provides that the state superintendent shall enter upon the duties of his office at the opening of the school year. At the present time he comes into office at the same time the legislature convenes, with no experience in the administration of the school laws, and as may well happen with little or no knowledge of the laws in existence, or any definite ideas as to needed changes in the laws. He thus finds himself unable to give information and advice to members of the legislature who may seek such information or advice as to legislative matters pertaining to education.

Term of Office and Mode of Selecting Other Officers of Public Instruction Should be Controlled by the Legislature as in the Case of Other Officers.

The amendment also provides that the term of office, time and manner of electing or appointing all other officers of supervision of public instruction shall be fixed by law, which is exactly what is done in the case of all other offices, state or local, which are not constitutional offices.

The representatives of the people in the legislature may safely be trusted to perform the duties devolving upon them by this amendment, and in the interests of the people whom they represent.

This circular is sent out in order to call the attention of the people to this important amendment, and to inform them fully of its provisions. It is in no sense a political measure. Of the one hundred and thirty-three members of the legislature, but two voted against it in 1899, and in 1901 but three voted against it. A favorable vote upon the amendment is of the most vital importance to the educational interests of the state.

L. D. HARVEY,
State Superintendent.

STATE OF WISCONSIN

14
State Historical Society
OF WISCONSIN,
MADISON. - WIS.

Examinations for Teachers' State Certificates and for the County Superintendent's Certificate.

1902.

Times and Places.—The examination for teachers' state certificates will be held as follows for 1902:

August 12, 13, 14, 15, 1902, High School Building, Madison.
 December 29, 30, 31, 1902, and January 1, 1903, High School Building, Madison.
 The examinations for County Superintendent's Certificates will be held as follows:
 June 30 and July 1, 2, 3, 1902, Ryan High School Building, Appleton, Wis., at the High School Building in Eau Claire, Wis., and the High School Building in Madison.
 August 12, 13, 14, 15, 1902, High School Building, Madison.
 December 29, 30, 31, 1902, and January 1, 1903, High School Building, Madison.

Board of Examiners.—Supt. C. F. Viebahm, Watertown, Chairman; Albert Hardy, Platteville; Dr. J. W. Stearns, Madison.

Reports.—As soon as practicable after the examinations, the standing of applicants will be determined and reported to the State Superintendent, and a statement giving results of such examinations will be sent from his office to each candidate. Notice of omissions or apparent errors should be addressed to the State Superintendent.

Concessions.—The requirements of the examiners are absolute, and no material modifications of them should be asked in individual cases.

Stationery.—Stationery needed will be furnished by the Board of Examiners.

Character of the Examinations for Teachers' State Certificates.—The following list shows the branches in which candidates will be examined. The minimum standing required in each branch is 65, and the minimum average standing required for a certificate is 75.

I. **ELEMENTARY BRANCHES required for the limited (five years) certificate:** Reading, orthoepy, orthography, writing, English grammar, arithmetic, geography, U. S. history, algebra, geometry, civil government, theory and art of teaching, physiology, physics, English literature (historical), mental science, manual of the course of study for common schools, elements of agriculture, American and English literature, English composition and English history.

II. **ADVANCED BRANCHES required in addition to the preceding for the unlimited certificate:** Botany, zoology, political economy, general history, history of education, *geology, *chemistry, *astronomy, †English literature (critical), †Latin.

Experience—Moral Character.—To obtain the limited certificate, the candidate must have taught successfully at least twelve months; and to obtain the unlimited certificate, he must have taught successfully at least twenty-four months. Satisfactory evidence of moral character and successful teaching are required for which the candidate must furnish to the Board acceptable references.

Time Limits.—Candidates for limited certificates will be allowed trials at three consecutive sessions of the Board of Examiners in which to complete the examination; but if three trials are taken, the standings obtained previous to the third trial must be above the minimum average, or must be brought up by re-examination at the third trial.

Candidates holding the limited certificate will be allowed trials at any two consecutive sessions of the Board of Examiners during the validity of the certificate held, in which to complete the examination for a life certificate. Candidates for the life certificate who hold normal school certificates, will be required to pass examinations in algebra and geometry in addition to the studies listed under II.

Within the times herein fixed, re-examinations will not be required upon branches in which a satisfactory standing has been attained.

Persons who hold a county superintendent's certificate may within one year from its date secure a limited state certificate by passing the examinations in English Literature and Mental Science.

Selecting Examinations.—Candidates are advised not to attempt to pass all the examinations at one session, but to distribute their work so as to write in not more than one branch in any half day. That this may be done, the program of examinations remains unchanged from year to year.

Suggestions for Preparation.—For the guidance of those who desire to review any of the studies before examination, or are making original preparation in these branches, the follow-

*The candidate may elect any one of these three branches.

†The candidate may elect either of these branches.

ing information is given. The text books are designed for convenience only. The candidate may prepare from any books of equal rank with those named. He must, however, be sure that the book selected is of equal rank, as the tests suggested represent the minimum amount of knowledge which the Board of Examiners deem sufficient.

The candidate will be expected to draw correctly and creditably any apparatus or structure described in the papers on physics, physiology, botany, zoology and geology.

In connection with the work in physics, zoology and chemistry, the candidate will be required to present a laboratory note-book, which is a genuine record of experiments performed by him, and duly certified, of data gathered or work done, with the usual accompaniments of diagrams, observations and conclusions. For satisfactory work in these lines, credit will be given in each of the three branches.

READING. The candidate will be examined orally in these lines:—1. Grasp of the author's meaning. 2. Expression. 3. Pronunciation. 4. Kinds of poetry and meters. The object of the oral test is to form an estimate, not only of the candidate's scholarship, but also of his personal characteristics and his use of language.

AGRICULTURE. James' Practical agriculture, (Appleton's), or Bailey's Principles of Agriculture, (Macmillan).

COMPOSITION. Lewis' First Book in Writing English (Macmillan); Scott & Denny's Elementary Composition, (Allyn & Bacon); Maxwell & Smith's Writing in English, (American Book Co.).

ENGLISH HISTORY. Larned's History of England, (Houghton, Mifflin & Co.).

AMERICAN LITERATURE. Pattee's American Literature, (D. C. Heath).

CIVIL GOVERNMENT. Familiarity with the text of the constitutions of the state and nation, with Fiske's Civil Government in the United States and Hinsdale's American Government will be required.

PHYSIOLOGY. Martin's, the Human Body (briefer course).

PHYSICS. Gage's Physics, or, preferably Carhart and Chute's Physics. (Latest editions.)

GEOGRAPHY. The paper given on this subject will test the candidate's knowledge of mathematical, political and physical geography. Hinman's Eclectic Physical Geography, or Redway's Elementary Physical Geography.

THEORY AND ART OF TEACHING. Fitch's Lectures; Report of the Committee of Ten, the English, Mathematics, Natural History and Geography Conferences; the Report of the Committee of Seven on the Study of History in Schools, and Hinsdale's, The Art of Study, The Art of Teaching, White.

HISTORY OF EDUCATION. Browning's History of Educational Theories, Laurie's Rise and Constitution of Universities, first seven lectures; and Martin's Evolution of the Massachusetts Common School System.

ZOOLOGY. Orton's Zoology and Jordan & Kellogg's Animal Life.—A knowledge of the chief types of animal structure, acquired by dissections, is demanded.

ENGLISH LITERATURE (critical). Shakespeare's Macbeth, Merchant of Venice, and Julius Caesar; Coleridge's Ancient Mariner; Scott's Ivanhoe; Carlyle's Essay on Burns; Tennyson's The Princess; George Eliot's Silas Marner; Milton's Lycidas, Comus, L'Allegro and Il Penseroso; Burke's Speech on Conciliation with America; Macaulay's essays on Milton and Addison; Kipling's The Day's Work; Stevenson's Kidnapped; Longfellow's Keramos. The selections from Shakespeare, Milton, Burke, Carlyle and Tennyson are required, and the examination upon them will be in writing. The candidates may select any three of the other prose works with the other specified works from the poets, for the oral examinations.

LATIN. Grammar, Ceasar (4 books), Cicero (6 orations), Virgil (6 books of the Æneid).

GEOLOGY. Leconte's Compend of Geology, and a knowledge of the general geological history of Wisconsin. Field notes in geology will be required.

POLITICAL ECONOMY. F. A. Walker's (advanced course); Bullock's Introduction to the Study of Economics; and Ely's Outlines.

GENERAL HISTORY. Myer's & Allen's Ancient History, and Meyer's Mediæval and Modern History, or Thatcher and Schwill's General History of Europe.

CHEMISTRY. Remsen's Chemistry (briefer course). A practical knowledge of laboratory work and experimentation is required.

ASTRONOMY. Young's Elements of Astronomy.

MENTAL SCIENCE. James's Psychology from Chapter X.

ENGLISH LITERATURE (historical). Pancoast's Introduction to English Literature.

BOTANY. Atkinson's Elementary Botany and Coulter's Plant Study. The candidate is expected to acquire much of his knowledge by a study of plants themselves in the field and laboratory. Special attention is called to the necessity of studying the lower plants, as well as flowering plants. Candidates cannot hope to pass the examination in botany solely by the study of the text recommended. The preparation should include the careful study, throughout at least one year, of various types of plants in the field and laboratory.

Unlimited State Certificates and Special Licenses on Diplomas.—Section 458c of the school code of 1901, provides that upon the recommendation of the Board of Examiners, the state superintendent may issue the unlimited state certificate to the holders of the diplomas of state normal schools, outside of Wisconsin, whose courses of study are fully and fairly equivalent to the courses of study in the Wisconsin Normal Schools, and the diplomas of colleges and universities other than the University of Wisconsin, whose courses of study are fully and fairly equivalent to corresponding courses in the University of Wisconsin. Graduates of colleges and universities must present to the State Superintendent of Public Instruction with their diplomas, satisfactory evidence of having given to psychology and pedagogy at least as much study as is required in this state of candidates for a life certificate. The holders of such diplomas desiring to obtain the state certificate should observe carefully the following directions:

1. Send the diplomas to L. D. HARVEY, State Superintendent, Madison, Wis., in time for action by the Board at its meetings announced in this notice.

2. Send with it the catalogue of the institution granting the diploma, for the year closing with the date of the diploma.

3. Send three references as to character.

4. Send three references as to success in teaching in the public schools of Wisconsin for at least two years. They should be persons who have seen your work and who are competent to judge of it.

Holders of diplomas, lacking the necessary experience in teaching but otherwise qualified may, if they so desire, receive a special license for two years by complying with the directions given above.

Character of the Examinations for the County Superintendent's Certificate.

The following list shows the branches in which candidates will be examined. The minimum standing required in each branch will be 65, the minimum average of all will be 75. Reading, orthoepy, orthography, writing, English grammar, and grammatical analysis, arithmetic, geography, United States history, algebra, geometry, constitutions of the United States and Wisconsin, theory and art of teaching, physiology, physics, physical geography, manual of the course of study for common schools, elements of agriculture, American and English literature, English composition and English history, school law, organization, management and supervision of district schools.

See specifications on opposite page, for branches named in the above paragraph.

The school code may be purchased of the State Superintendent for twenty-five cents. In making a study of school law, etc., candidates should give special attention to the matter included in I, III, IV, V, X, XII, XIII, XVI, XVIII, of the table of contents of the code; the Report of the Committee of Twelve on Rural Schools, article, Supervision, and appendices F, G, H, I, M and O; also the Manual for the Common Schools of Wisconsin.

Candidates for this certificate will be required to furnish a thesis based on original investigation in reference to school work in their county. The thesis will be an account of the actual inspection of at least two country schools and should be prepared before coming to the examination. It will be judged both as to matter and to form, that is, as an English composition.

Time Limits.—An applicant will be permitted to begin his examination at any regularly appointed examination, but must complete it before the corresponding examination in the ensuing year. Within the time herein fixed, re-examination will not be required upon branches in which a satisfactory standing has been attained.

Testimonials of Character.—Applicants must furnish to the State Superintendent three acceptable references of persons who will testify to their character.

Value of County Superintendent's Certificate.—This certificate, together with eight months' experience in teaching, constitutes a legal qualification to hold the office of county superintendent. *It also legally qualifies the holder to teach in any public school in the state for which a first grade county certificate is now a legal qualification, and remains in force during the life of the holder, unless sooner revoked by the State Superintendent.*

Assistants in Free High Schools.—Assistants who are required by law to pass special examinations in studies not included in the life certificate, may write at these examinations. These special subjects are included in the program.

General Program.

The sessions of the Board of Examiners begin promptly at 9 A. M. and at 2 P. M. and close at 1 P. M. and at 6 P. M. At the close of the sessions, papers must be presented whether completed or not.

Limited State Certificate.

9:00 a. m. Arithmetic.
10:00 a. m. Civil Government.
2:00 p. m. Physiology.
3:00 p. m. Grammar.

Unlimited State Certificate.

FIRST DAY.

9:00 a. m. Oral in English Literature.
10:00 a. m. History of Education.
2:00 p. m. Zoology.
3:00 p. m. English Literature (critical), or Latin.

THIRD DAY.

8:00 a. m. Manual.
9:00 a. m. Composition.
10:00 a. m. Agriculture.
2:00 p. m. English History.
3:00 p. m. American Literature.

FOURTH DAY.

9:00 a. m. Geometry.
German.*
10:00 a. m. Theory and Art of Teaching.
Rhetoric.*
2:00 p. m. English Literature (historical).
Book keeping.
3:00 p. m. Mental Science.

9:00 a. m. Geology or Astronomy, or Chemistry.
10:00 a. m. Political Economy.
2:00 p. m. General History.
3:00 p. m. Botany.

County Superintendent's Certificate.

9:00 a. m. Arithmetic.
10:00 a. m. Constitution of U.S. and Wisconsin.
2:00 p. m. Physiology.
3:00 p. m. Grammar and Grammatical Analysis.

9:00 a. m. Algebra.
10:00 a. m. U. S. History.
2:00 p. m. Natural Philosophy.
3:00 p. m. Geography.

8:00 a. m. School law.
9:00 a. m. Geometry.
German.*
10:00 a. m. Theory and Art of Teaching.
Rhetoric.*
2:00 p. m. School Supervision, Organization and Management.
Book keeping.*
3:00 p. m. Physical Geography.

*Special branches for assistants in high schools.

NOTE.—Orthography and penmanship will be judged by the papers in the other branches submitted by the applicant. Examinations in reading and orthoepy will be held the first day of the examination at such times as shall suit the convenience of the examiners.

L. D. Navvy

MADISON, WIS. DEC. 23, 1901.

State Superintendent.