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 ....................................................... 2
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 229,000
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 alodial 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-
region 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 Monteagle, 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. Courtney 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.
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).


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.