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**INDUSTRIAL EDUCATION IN OUR PUBLIC SCHOOLS-
ITS NEED AND PROGRESS.**

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INDUSTRIAL EDUCATION IN THE PUBLIC SCHOOLS

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INDUSTRIAL EDUCATION IN OUR PUBLIC SCHOOLS--4

ITS NEED AND PROGRESS.

Industrial Education is not apart from, but an important phase of our present system of education. It is that part of education which aims at a higher efficiency of all classes of people. The industrial education in its various divisions can and should be correlated with our present public school system. Industrial work is a liberal and practical part of education which can be added without excluding the classical and scientific studies in our present courses. It will not displace, but it will enrich and make more useful the cultural studies now offered.

The purpose of industrial training in our public schools should not be to give a narrow or short cut preparation for some specific occupation, to the entire exclusion of the cultural side, but to give the kind of an education to each student that will better prepare

him for a life work, which will benefit himself, will make him more useful to his employer, and thus benefit society.

History of Industrial Education in the United States.

Until the middle of the last century the industrial life of our country was composed of small units and industrial training was given little attention from an educational standpoint. The division of labor was in its elementary stage and some form of training beginners, in any line of industrial work, was much more common. The school was exerting its efforts to give an elementary education to all of the children of the country and the shop and factory was training its own apprentices.

In the last sixty years the tremendous increase in size of productive units, the introduction of machinery, the increased quantity of production, and the rapidly

increasing division of labor have greatly changed the social and industrial conditions in the United States. With these changes, in nearly all of the industries, it has altered their organization so that most of the workers require skill only in a few operations and the others, a much smaller class, much greater skill and intelligence than before.

Much industrial work has also been taken from home life into the factories, so that the boy or girl on the farm, in the village, or in the cities, does not have a part in, or even a knowledge of, the industrial work which was formerly a part of his daily duty in home life.

During this great industrial expansion of our national economic life, during the last sixty years, both the public school and the shop have held for the most part to their original attitude and methods of training. In the last few years, however, the necessity of better methods of training for the various vocations have been realized.

It was first found that in the double problem of

cultural and vocational education that the school must assume an increasing share of the burden of preparation, of the ambitious young people, for technical training demanded in their daily work. A number of private evening schools were first established in New York, Philadelphia, Cincinnati, and Richmond, but instead of leading to industrial work in public schools, the public evening schools have almost entirely confined their work to elementary instruction in the common branches. In recent years a few specialized courses to provide for the industrial needs have been added to the public evening schools.

Manual training in the general course of study, as an element of culture and general efficiency, was finally begun in the manual training department of Washington University at Saint Louis in 1880 and was rapidly followed by the establishment of manual training high schools in other cities. Part of these were private schools, but many were part of the public school system.

Between 1887 and 1890 manual training was introduced into the elementary school in the form of shop work in the upper grades and now it is represented in some form thruout the grades in many of the larger cities.

The advantages of the manual training courses as seen at first were that it called for observation, trained the reasoning powers, and strengthened the will. Later the emphasis was placed on the value of working for something useful, and this idea made manual training interesting, realistic and practical.

During the last few years the social meaning of education has called attention to the subject-matter, and the conception of manual training, especially in the elementary school, has become an educational instrument interpreting the fields of art and industry in terms adapted to the life of the child.

Up to 1901 there were only four trade schools in the United States and these were made possible by large endowments. They were the New York Trade School, the Williamson Free School near Philadelphia, the

Baron de Hirsch School of New York, and the Miller School of Albemarle, Virginia.

* Since 1901 a number of trade and commercial schools have opened in different parts of the country, and in 1907 the Milwaukee School of Trades passed into the hands of the city, and the operation of public trade schools began. The problems of these schools, in their present experimental stage, have been the questions of support of the student worker, the expense of administration, instruction, materials, and the restriction to students above sixteen years of age, when most of the boys must enter upon remunerative work.

Since the report of the Massachusetts Commission on Industrial and Technical Education made in 1906, in which much emphasis was placed upon the lack of economic progress experienced by children, who leave school before graduation and enter industrial work before the age of sixteen, another type of school, preparatory trade schools for boys and girls between fourteen and sixteen has been under discussion.

* Charles R. Richards, Director of Cooper Union, N. Y.

Apprenticeship in the Trades.

The modern apprenticeship system in the various trades of this country had its beginning in the years from 1860 to 1872. Forty three states have laws relating to the employment of apprentices. Thirty eight states provide that in addition to the trade the apprentice shall be taught the common English branches of education in some public or other school, or thru such means as the employer may provide. The general conditions, as found by the Boston Vocation Bureau, among the older and larger machine shops are as follows: " There is an indenture or agreement of apprenticeship. The age preferred for entering is sixteen or seventeen and the age limits are fifteen and eighteen. The usual length of time required is four years, with a probationary period of two months. The pay is generally eight cents an hour the first year, ten cents the second year, and twelve and a half cents the third, and fifteen cents the fourth year.

There is a bonus of one hundred dollars payable at the end of the period of apprenticeship . Against this bonus each apprentice may be charged for tools, technical books, and drafting equipment. Time used in study counts as actual service in the shop. Wages are paid weekly, for fifty four hours in the winter, and fifty five in the summer."

Many large shops have established schools within their own premises wherein their youthful employees may receive technical or academic training to supplement the practical learning acquired in the practice of their work. These are but indications of possibilities in the field of vocational education.

Trade Schools.

Trade schools have aided greatly in securing greater industrial efficiency. In the East where these schools have been established they began in a small way with two classes, these classes were opened because the

principal demand seemed to be for instruction in these trades. One of these schools, now in its twelfth year, has four classes in machine shop work, two in plumbing, one in pattern making and other wood work, two in mechanical drawing, and two each in shop mathematics and electricity.

The courses laid out for the classes are as thorough as it is thought possible to make them in an evening school. But there is no definite sequence of courses leading up to graduation. Some men, however, each year have proved themselves competent and are given certificates of proficiency. The attendance has more than quadrupled since the first year.

From the first the general policy of the school has been to receive as members those who had had some experience in the trades represented in the school. There are necessarily some variations from this policy, particularly in the classes in mechanical drawing, electricity, and mathematics, which offer a more or

less general training useful in many trades.

The chief significance of such a school is to be found in the evidence it furnishes of the need of enlarged opportunities for training to be offered to those who are already employed in the narrow lines required by the specialized trades of other kinds. This is a definite contribution to trade training that every manual training school in the country, within the limits of its equipment, can offer and ought to offer. These schools should open all of their shops, laboratories and their courses in science, mathematics, and mechanical drawing to those who have the greatest need for the instruction which these facilities are designed to give. To most of those engaged in industrial occupations, who have experienced the lack of opportunities in the modern shop, such instruction as the manual training schools of the country could give would be a liberal education. To every earnest workman it means a certain degree of breadth in place of narrowness; it means increased power, greater self respect, greater

value to himself and to those dependent upon him. It means that the young man, who has been stationed for five years at the same machine and might otherwise remain there ten years longer is set free to range among the large number of machines and become familiar with them all, it means the freedom that education always gives. Evening trade schools, for mechanics, and those of other classes, of a private nature, however numerous cannot fully supply what is lacking in the existing system of public schools. We must have a much greater extension of industrial education into our public school system.

In Germany where the aim is to create a very effective and consolidated nation, largely with a military purpose in view, school training definitely shapes itself to teach every boy what he ought to know to earn his living and play his part.

* Practically all of the children of Germany, boys and girls, rich and poor, high and low, up to their fourteenth year, go to elementary schools supported

* Commissioner of Education, N.Y.

and directed by the state. At about ten years of age, the boys and their parents are expected to decide whether they are to prepare for a trade or a profession. If the boy is to prepare for entering one of the trades, he goes at the age of fourteen to a trade school or into a shop as an apprentice. If a profession is chosen he attends a school which is either literary and classical, or scientific, depending upon the profession selected.

German schools are provided for every conceivable purpose in life. Nothing excuses from attendance, and the schools keep possession of the child up to the seventeenth or eighteenth year.

The trade schools teach definite trades. They are all grades and kinds from those that give simple manual work up to expert work, such as is required from a craftsman in weaving or in making china. This trade-training runs parallel with their book instruction. Germany, like most of the other countries on the continent, separates the trade and professional training from the cultural much more than it would be well

to do in the United States. Where the class distinction is so marked it is easier and less harmful to maintain the separate schools for the various trades and professions, but it tends to greater class cleavage and less educational unity.

Germany is seeing the disadvantages of its present system in this regard, and is anxious to develop a greater unity in its educational system. It has found that it needs to promote industrial activity not alone by theory and technical skill but also in a practical direction. The German workman must, in his knowledge, and in his ability to do, be lifted to a higher level. They have found that along with their excellent trade education should also be furnished more favorable conditions to stimulate more class unity and a greater desire and love for their manual and educational work.

The Problem.

An important work in the consideration of this great problem, especially the relation of industrial education to the general system of education of the country, is being done by a committee of the National Society for the Promotion of Industrial Education.

The realization that our country is so far behind in this movement, especially in comparison with such countries as Germany, and that our apprentice system can offer industrial education to only a comparative few has led to a thoro investigation. Under the present conditions there are very few facilities for the training of young men for industrial pursuits, and the opportunities for those now engaged in the various trades to improve their skill by theoretical training is possible in a very few schools.

The majority of children leave school in the grammar grades and the training school, which will help this great body of students, must as the National Society suggests fulfill certain conditions. " It must articulate

with the present public school system preferably with the grammar school department. Our schools should at that age provide to lead many of the boys and girls into vocational work of some kind.

For those that must pass out into vocational life or vocational schools, at the early age of fourteen to eighteen years, the grammar schools must do their part in developing the vocational purposes of the students, especially concerning the advantage of skilled work. "

Every study should be so taught as to bring out its application to life, particularly to the skilled vocations, altho the studies in the grammar school would not be so taught as to provide complete preparation for any particular trade.

All of our public schools should introduce elementary industrial training in some form, manual training at the bench, at the forge, in practical agriculture, or in household pursuits, wherever the training could be effectively given.

The complete education of each individual should consist of two main parts one non-vocational and the other vocational. The former apprenticeship system has ^{been} past away and instruction of all kinds is now thrown upon the various school systems. The free public schools, for rich and poor, must furnish an education which is demanded by our commercial and agricultural advance, and on the other hand, it must not like the trade school be limited by the demands of a certain vocation.

At the present time, about 95% of the people of the United States are following industrial pursuits. We must of necessity meet the growing needs of this great class by that instruction which will lead to greater working efficiency and better preparation for life.

Education is a public as well as a personal matter, and the interests of the state require that the ratio of individual efficiency in all lines shall be constantly increased. Among the needful activities one occupation is as important as another,

and the right adjustment of our educational system will enrich them all.

* " We have planned the work of our public schools almost entirely with reference to culture; we have done very little to stimulate a vocational purpose, and less still to provide for the realization of that purpose. In other words, while the schools have laid stress on culture as the end of education, they have laid almost no stress on preparation for a vacation. We may go farther, and say that not infrequently, the schools have even disparaged vocational purposes in the training they give."

It is strange that we should be so reluctant to admit the distinctly useful into our scheme of public elementary and secondary education, that is, to admit that one of the functions of the public schools is to recognize the claims of elementary vocational training as entirely legitimate and desirable.

* Paul Hanus, " Beginnings of Industrial Education".

Our elementary schools and our high schools together constitute, one continuous educational scheme thru which a youth, whatever his circumstances in early life may be, may secure the elements of general culture; and thru which, if his circumstances permit, he may attain on the basis of the preparation secured in school, a college education, or enter at once on professional study in most of the professional schools in the country. We have thus planned our educational scheme primarily in the interests of those who have a long educational career ahead of them, and who need not therefore give any immediate attention to preparation for a life pursuit. Nevertheless it is well known that the greater number of our youth are obliged to leave school at the end of the grammar school period, or when they have attained fourteen or sixteen or eighteen, the upper limit of the compulsory school age.

The present educational need is for schools which will better train men, workers, and citizens. Our schools at the present are doing good work and are

doing it better than ever before. Of course there are those who will not be convinced, and those who give destructive criticism instead of constructive work, who say that the public schools of today are not doing as good work as they did a generation ago.

To find whether such statements were well founded many old test papers written more than a generation ago have been secured and trials made by giving the same examination questions to pupils in the schools of today. The results of those examinations were very much better than when the same questions were answered a generation ago. This experiment was tried in New York, Boston, and in other parts of the country and always with similar results.

The public schools are not only doing more work, but a great deal better work than they have done in the past. However, with the changes of industrial and commercial conditions they are now called upon to greatly^{to} extend their present field of work. They must eliminate much of the present material, and at the same

time add new courses of a practical and vocational nature to meet the growing demands of the times.

Consolidation of Rural Schools.

One of the important steps in the progress of industrial education is to be made in our rural communities. Research into every possible phase of home and farm life is being made with constantly increasing interest. It is becoming an economic necessity that this body of practical knowledge be used, and that means be provided thru which it may reach all people in the rural communities.

The changed economic conditions, which have given a new direction to urban life and institutions, are also extending their influence to the rural districts. As a result, we must have a reorganization of our country life affairs and institutions. Agriculture is rapidly becoming more specialized, more difficult, and calls for better methods. From year to year a

higher premium is placed on the intelligence, on the better understanding of farm management, of crop production, of the raising of live stock, and the use and adjustment of expensive and often complex machinery.

Thru farmer's institutes, traveling lecturers, bulletins, demonstration farms, and other forms of extension work, large numbers of the rural population are being given much useful knowledge of agriculture. However, the chief instrument in the vocational education of the agricultural producers and home makers of the coming generations is to be the consolidated rural school.

This plan of having students transported at public expense, from several small school districts to large central schools, has proved exceedingly successful. Most of these primitive institutions all over the country will, in the near future, be merged into large consolidated schools equipped with all modern conveniences for the giving of classical, scientific, and industrial training work.

This new system with its larger administrative unit, will give an incentive to make permanent improvements, to beautify school grounds, secure modern sanitation, and provide ample school room equipment. With the better grading, larger buildings, and better trained teachers, courses in agriculture, home economics, manual training, music and many others can be given which would be impossible in smaller district schools.

The centrally located schools with their commodious rooms or auditoriums are social centers for the rural communities. They encourage literary and debating societies, social and agricultural clubs, reading circles, athletic clubs and entertainments of a varied nature.

During the past five years more consolidated schools have been constructed in the United States than during the twenty five years preceding. * It is now a part of the rural school system of thirty two states. Eighteen hundred completely, and not less than two thousand partially, consolidated schools in the United

* George W. Knorr, U. S. Field Agent, Consolidated Rural Schools.

States show the remarkable adaptability of the system to the peculiar needs of agricultural communities.

In most states consolidation is limited to scattered localities, but these with their numerous advantages will rapidly bring entire states into this well defined and progressive educational movement. Massachusetts, the oldest state in consolidation experience, is now spending over \$300,000 annually for the conveyance of students.

In the recent investigation of Mr. Knorr, United States Field Agent, not one case of the abandonment of a completely consolidated school was found. The success of a consolidated school depends largely upon the management of the conveyance department.

Free conveyance remedies very largely the dropping out of pupils before completing the eight grades. The fact that under consolidation twice as many children in a community complete the eight grades, as under the district school plan, is of immense educational and economic importance to the state and

nation. There results a direct contribution to national thrift thru added industrial efficiency, greater intelligence, wider information, and higher citizenship. We can by thus retaining attendance in the grammar grades facilitate and encourage many more to enter into high school work and at least two thirds, of the six millions of country boys and girls, should eventually receive their schooling and a part of their vocational education in consolidated schools.

The fact that vocational studies possess cultural as well as informatory value is at last being recognized and a beginning has been made in placing vocational studies in the high schools, grammar schools and elementary grades. With the adoption of the up to date consolidated rural school with its industrial subjects, especially adapted to the needs of the community in which it is located, we will have a new American institution which will wield an immense influence for the good of the country boy and girl, and will greatly increase the industrial efficiency and economic welfare of our country.

In many cases it will bring the high schools within easy reach of the rural population and these high school graduates, equipped with vocational knowledge, will be well fitted for scientific and intensive farming, or to make more thoro preparation and become experts in agriculture. Those who wish to take technical or professional courses may, on leaving the high school grades of the consolidated school, enter either agricultural, engineering, scientific, classical, or other courses in colleges or universities. The vocational studies they have pursued will be a decided advantage to them. They will be more observing, more skillful, and will be much better^{able} to choose their future work.

If the industrial position of our nation is to be determined by the number of years training given to the young people of the nation, it will be a very important accomplishment to add from two to four years of school life to several million boys and girls in our country.

In the consolidation of the rural school one of the

main problems has been that of the administrative unit. Trials have shown that on account of the conditions and interests involved in each, differing so widely, it seems best to ignore the small civic and political divisions.

Consolidation by townships, while it proved convenient in the New England States and in Ohio, Indiana and Dakota, is feasible only under certain conditions and cannot be carried out in all states with equal chances of success. Experience thus far in rural school consolidation suggests that, if possible, the unit should not be smaller than the county. The county, if adopted as a unit may be all, or nearly all, subdivided into consolidated school districts. The advantages of the county unit are; that it makes possible a selection of more efficient school boards since there is a wider field for the choice of men and women that are qualified. There is better administrative control of school affairs, ^{more} equitable distribution of school funds, and the advantageous subdivision of the county into school districts.

Minnesota has an optional county consolidation law, which embodies this feature of districting and formulates a comprehensive county plan before consolidating. Where this county unit plan has been tried, in several states, it has, in each case, resulted satisfactorily and suggests the means of introducing into a county a compact, economical rural school system, in which all children have equal opportunities and in which there is no duplication of expenditures nor of school work.

The consolidated rural school is a decidedly democratic institution since the students of perhaps an entire township meet, mingle, make friendships, and learn how to work together. It is free and accessible to all of the children within its boundaries. They all return home daily and, by doing their allotted work, keep in touch with the practical affairs of home and farm life, and thus remain for a longer time within the home influence during the most impressionable period of their lives.

These schools beginning, fortunately, at a time when the popular ideas of the purposes and aims of an education are calling for new studies, which have a vocational value, promises an important career for consolidated schools which will leave a lasting impression upon American agricultural and rural citizenship. The consolidated school is thus destined to mould the home and community life and broaden the individual activity as the district school can never do under the most favorable circumstances.

We will secure in this consolidation better school buildings and equipments, better grading, fewer and better qualified teachers, and better supervision. There will be less tardiness and much better attendance in general among the students. With proper conveyance all students will be under the care of responsible parties in trips to and from school. The schools will be financed in a business like manner, and better as well as more permanent improvements will be made. With the improved methods of heating, ventilating, and with better

light the pupils will be healthier.

With the many facilities which would be acquired and thenew industrial courses that would be offered in agriculture, home economics, technical and commercial education, the pupils would be given every opportunity to secure, near their homes, a thoro education in the practical work of their daily life, and the elementary preparation for other vocations. The physical well being of the students would be advanced by athletic contests and the schools would become the intellectual and social centers of the community life.

Industrial Education in the Intermediate School.

Experiments have been made, in the intermediate schools already established, to meet the demands for industrial education. Some of the existing schools are private or public and separate, and others are correlated with the regular public school system.

* In the Hebrew Technical Institute of New York City, the aim is to give their students a good education in both cultural and technical studies, but the higher branches of mechanical, civil or electrical engineering are not taught. They expect that the greater majority of their graduates will ultimately find positions as skilled artisans.

To enter this school boys are not required to have completed the elementary course, but must have a fair education along common lines, they may be as young as twelve years. During the first two years of the course they study the subjects which will be useful to them in whatever mechanical pursuits they may finally choose.

* N.E.A. 1910 Subcommittee, Intermediate Ind. Schools

In the third year they are encouraged to give special attention to that branch of work which seems most agreeable and suitable for each. A part of the work is academic, embracing not only general and technical vocational studies, but also cultural studies, such as English, History, and Civics. A large part of the work is concrete, based on the trades dealing with wood and metal. This concrete work in the last year assumes the specialized character, as instrument-making or practical electricity. Some attention is given to the physical well being of the pupil especially in regard to food and cleanliness. The school is adapted to produce good apprentices and its long growth proves that it has been successful, both in adhering to original aims and in realizing its aims for industrial growth. There are no conditions of the system in this school which could not be realized in a public school.

An example of an intermediate industrial school as part of the public school system is found in the Secondary Industrial School of Columbus, Georgia.

The aim of this school is to fit boys for two fundamental industries, mechanical work, wood and iron, and textile work. A course of three years is offered beginning with children of fourteen. More than half the work of each day is concrete in character, and follows conditions which would be found in the corresponding shop work. The year lasts for eleven months. The textile departments produce cloth for sale, tho some of it is used in other departments of the industrial school.

Another school now in operation which carries out a plan which has been advocated by many educators is the Intermediate Industrial School of Albany. " This school plans to take two years of the elementary period and two years beyond, children entering at or about thirteen to fourteen. The work of the first two years, as proposed, is about two-thirds vocational, technical and concrete; and one-third general, geography, history, literature and composition, and civics. Mathematics and drawing are taught with regard to vocational uses, hence are described as technical subjects. Part of the concrete work is varied so as to form, at option, beginning of training for the printing, or leather

working, or wood working, or metal working occupations. But so far, in the last two years, the courses seemed to plan mostly wood and metal working callings for boys, and textile industries and household arts for girls."

Technical Training in High Schools.

Many of our High Schools should have with other departments a technical course to especially aid those who expect to enter the trades. High schools with these courses are especially in the large cities for the education of boys and girls of secondary age who can not take up the work of the present high school and who desire to prepare primarily for some particular activity.

The Technical High School in Cleveland is probably the best example of a secondary school of this nature in the United States at the present time. * " It has high standards of technical work, it looks to an effective out-put, and it groups its academic subjects with reference to the needs of the technical problems. The

* Supt. Elson, Cleveland, Ohio.

student devotes about half of his time to technical and the other half to academic studies. The academic studies include language, mathematics, and science, together with some history and civics, hygiene and sanitation. The usual treatment of the various phases of the academic studies is not followed. That is to say, there is no attempt to teach algebra as a science, or geometry as a science, but rather such parts of arithmetic, algebra, geometry, and trigonometry are selected as are fundamental in carrying forward the requirements of the technical studies. The training in these is such as to give ready skill in the control of the necessary mathematical ideas to forward the technical problems in hand. The result of such instruction should be pupils with a ready, usable knowledge of the fundamental problems and processes in arithmetic, algebra, geometry, and trigonometry. Again, English, German, or French offers opportunity for giving the industrial bias to the work. The theme-writing can well include as topics the products and processes involved in manufacture. Such a school

therefore groups its studies, selects its topics, and arranges its instruction with reference to its fundamental needs of the technical side. It seeks to make efficient workers and intelligent workmen."

If the new high schools giving industrial work would offer a thoro training in English, industrial history, and economics, and such principles and applications of science as are likely to be useful in an industrial career, those students, with that definite purpose in view, could prepare themselves for industrial life. All of their instruction in the high school whether english, history, economics, mathematics, or science, either in the classroom, shop, or laboratory could be so designed as to be directly usable in the kind of occupations in which the graduates of the school will seek employments. The courses of study for these students must be intensive on the vocational side and at the same time the instruction should be suited to both the mental and the physical capacities of pupils fourteen years or over.

Mechanical drawing, mathematics, applications of elementary science and english, should be given to increase the efficiency in the more concrete and practical parts of the course.

By enlarging the sphere of the present public school system and adding this course which shall have for its aim, to impart the maximum amount of skill and technical knowledge in the minimum period of time, it will be economically possible for the future workman to attend the present system of schools for a much longer period.

Manual Training in High Schools.

* Most of the present manual training high schools are those in which shop work and drawing are offered mainly for the purpose of supplementing other studies for the so-called cultural purposes of education.

These manual training high schools are very much like the regular high school with a manual-training.

* N. E. A. Subcommittee, 1910. Industrial Education in the Secondary Schools.

department, for both are secondary schools in which the curriculum combines various elements of manual and academic work primarily for purposes of general training. They admit pupils of the same general type, of the same age, and of the same preparatory training. These schools aim to develop the same kind of intelligence, the same habits of thought, and the same kinds of ability as do the other high schools; and their graduates are found in the same wide variety of occupations. While the studies taught are not identical, the manual training schools are nevertheless essentially schools of the college preparatory type in which the instruction, mechanical as well as academic, aims to provide the mental equipment of the kind required of those who expect to continue their studies in higher institutions.

These institutions are serving a useful purpose in offering a large variety of means by which, pupils who are capable of higher study, can obtain intellectual training and preparation for higher institutions through subjects which are congenial and include a larger amount of hand work.

Agricultural Education in High Schools.

The demand for agriculture to be taught in the public schools is but a part of the great modern movement for industrial education. This problem is but a part of the greater one that must soon be developed, and that is, how to educate for all the useful activities of life. The American high school is rising to meet this new demand. Industrial education has, for the most part, already found its place in the universities. The next step is that it shall find its true place in secondary education.

Dr. True of the ^{federal} department of agriculture divides secondary agricultural education into five classes.

(1) High schools connected with agricultural colleges, as in Minnesota and Nebraska; (2) separate agricultural high schools endowed by the state, as in Wisconsin, Alabama and California; (3) private agricultural schools as in New York, New Jersey, Pennsylvania, and Indiana; (4) agricultural courses in normal schools, as in Missouri; (5) agricultural courses in public high

schools". These are now being rapidly developed in our own state.

The first agricultural school of high school rank was organized in Minnesota. In our School of Agriculture at St. Anthony Park one third of the studies given are of an academic nature; one third, of work in the sciences upon which agriculture rests, personal investigation by the student rather than mere book study; and one third relates to the practical affairs of the farm and household.

The course of study covers three years of about six months each. This gives six months for practical work upon the farm. The subjects given are as follows:

First year,

English, farm arithmetic, agricultural botany, comparative physiology, agronomy, music, gymnastics, drawing, blacksmithing, carpentry and military drill.

Second year,

Algebra, agricultural chemistry, agricultural physics, agronomy, animal husbandry, dairying, horticulture, music, gymnastics, and military drill.

Third year,

Home economy, geometry or civics, entomology, zoology, agricultural chemistry, agronomy, poultry culture, animal husbandry, dressing and curing meats, forestry, music, gymnastics, and veterinary science.

Instead of shop work and a portion of the work in agriculture, the girls are given courses in domestic science. The two chief objects of the school are to fit young men and women for successful farm life, and it serves as a preparatory school for the college of agriculture. The Wisconsin legislature passed a law in 1901 authorizing county boards of education to establish and maintain county schools of agriculture and domestic science. It was provided that instruction be given in the elements of agriculture, including work concerning the soil, plant life, animal life and a system of farm accounts. Instruction in manual training and domestic science is given with such other subjects as are prescribed.

Each school is required to have connected with

it a tract of land of at least three acres in area. This land is utilized for experimentation and demonstration. Normal training is being carried on in some of the county schools and an especially practical school of this kind is located in Dunn County at Menominee, Wisconsin. These courses will solve the problem of lack of trained teachers which is seriously affecting the introduction of nature study and the elements of agriculture into the primary and secondary schools.

Manual training and domestic science are still contending with this same difficulty, but with the new awakening, of the farmers and manual workers, to the fact that education can be of great practical value to them, schools for training more teachers for this work are being supported.

The agricultural high school and college, farmers institutes, agricultural experiment stations, and the United States department of agriculture are the chief agencies which are now educating the farmers of this

country concerning the importance of science and nature study for the successful farmer of today and of the future.

Altho the primary object of teaching agriculture in our high schools is to prepare men and women for farm life without their having to go to college, we should realize more fully that it is one of the best liberal studies for doctors, lawyers, merchants or teachers. On account of a fuller realization of its importance the interest in agriculture now included most of the population. Nearly every one has some interest in growing plants or animals and every boy and girl should have an opportunity to learn about them if they so desire, for the educational training and intellectual interest that this knowledge brings.

As the free lands and the low priced lands disappear, there will be no place for the inefficient farmers. They will be crowded into the cities to work in factories under supervision.

Instead of teaching agriculture to keep boys on

the farm, we will soon be teaching agriculture to train farmers to raise two to five times as much as they do now on the same tract of land. Agriculture should have a place in every high school and a very important place in all high schools in farming communities.

Rapid progress has been made in the state of Minnesota during the past few years in the addition of agricultural work in many of the state high schools and special impetus has been given to this movement by special aid granted by the state in 1909. By an act approved April 19, of that year, the legislature of Minnesota provided that any state high school, graded, or consolidated rural school having satisfactory rooms and equipment would upon application to the state high school board, if accepted, be designated to maintain an agricultural department. Each of such schools shall employ trained instructors in agriculture, manual training, and domestic science, and have not less than five acres of land. Instruction in the industrial department shall be free to all residents of the state. The department shall offer instruction in soils, crops,

fertilizers, drainage, farm machinery, farm buildings, breeds of live stock, stock judging, animal diseases and remedies, production, testing, and hauling milk and cream, manufacture of butter and cheese, growth of fruit, berries, management of orchards, market garden and vegetable crops, insects injurious to plants, diseases to plants, animal nutrition, including the use of forage crops, cereal grains, fine seeds, book keeping, farm accounts, and all other matters pertaining to general practice.

Each of the schools shall receive state aid equal to two thirds of the amount actually expended upon such department and vouched for, but in no case to exceed \$2500.00 per year. Not more than ten schools shall be aided the first year nor more than ten added to the list every two years thereafter. No more than one school in any county shall be added to the list receiving aid in any two years.

The act provided also that for the purpose of extending the teaching of agriculture, home economics,

and manual training to pupils in rural schools, and for the purpose of extending the influence and supervision of state high or graded schools over rural schools, one or more rural schools may become associated with any state high or graded school maintaining a department of agriculture, which shall be designated as the central school. The act provided that rural school districts may levy a tax of not less than one mill nor more than four mills for the maintenance of agricultural education in the rural schools, which shall be under the supervision and direction of the principal of the central school. *.

The recent legislature of Minnesota by an act approved April 5, 1911 amended the above Putnam act and provided for the establishment of departments for the carrying on of this work in twenty more schools in addition to the ten designated in 1909.

** By an act of the Minnesota Legislature approved

* Putnam Act, Chap. 247, Minn. General Laws 1909.

** Benson-Lee Act, Chap. 91, Minn. General Laws 1911.

April 7, 1911 any High School or Graded School which shall maintain such a course as the High School Board of this State shall prescribe in Agriculture and either in Home Economics or in Manual Training, shall receive annually in addition to other aid the sum of \$1,000 for maintaining such industrial courses. This aid is not to be paid to any school receiving aid under any other act, for the maintenance of industrial courses.

Domestic Science in the High Schools.

There is also an imperative need for industrial education for the girls in our high schools. Courses which will prepare them for home life and if necessary to earn a living wage and thus provide self maintenance if thrown upon their own resources. Thru proper instruction they should be trained to assume the responsibility of homes of their own with an intelligent preparation, and thus bring about a high type with the

best standard of health and morals.

Courses of instruction should train for distinctly feminine occupations such as dressmaking, millinery and cooking. If these courses are given in our high schools, girls will know some specific kind of remunerative skilled work. They can thus earn a livelihood after school work, and prior to marriage, for their own good and the good of society. This will raise the standard of living in the home of their parents, give a higher level in the homes which they start, and afford protection and support in case of loss of the head of the family.

The girls should also have nearly all of the advantages and facilities of the industrial work given to the boys besides their own special opportunities and experiences. The study of food teaches them how to avoid poorly balanced food rations. By becoming a trained judge of food values, they add facts and skill in the cooking of cereals, meats and vegetables.

The girl learns to choose clothing, decorate the home,

secures ideas concerning social affairs, and the care of the sick and children. With the widening acquaintance and accumulation of knowledge she grows in social grace, in personal virtue and the inspiration, to become the queen of a truly splendid home, is broadened and deepened.

Unity and Democracy in Education.

The United States as a country has been backward in realizing the need and importance of industrial education. This can undoubtedly be accounted for to a great extent by the immense natural resources of our country. On account of these the imperative demand for skilled workmen and specialized labor has not been felt so keenly as in the important European countries.

With the rapidly growing population, the using up of our natural resources, and the keener competition in all lines of enterprise, we are facing a new and rapidly changing economic condition. With this evolution which has done away, for the most part, with the old

apprentice system, there has been a rapidly increasing demand for specialized training in nearly all skilled work.

Men engaged in the manufacturing industries complain that there is a dearth of men whose training has been sufficiently broad in a particular line of work in which they are engaged, to fit them as foremen and department superintendents, and they are demanding that some means shall be provided to prepare men more adequately for effectiveness in the industrial field.

Men of affairs are awakening to the conditions which exist in some of the other countries of the world, especially in Germany, due to the establishment of numerous trade and technical schools, and are recognizing that our educational systems make no adequate provision for giving such training, and that with the going out of the apprentice system, nothing has been provided to take its place.

They have noted the marvelous strides Germany has made in recent years in the industrial world, and have

studied the reasons. They have found them not in the advantages of raw material, transportation or natural resources, for we possess them to a degree far in excess of any country in the world, but in the development of the technical and industrial system of education in Germany. They are therefore demanding a modification and practical improvement in the American educational system along these lines.

During the last few years educators have been studying this problem and they have come to recognize that the fundamental things in educational effort are to develop for efficiency in productive capacity, for culture and for good citizenship. These elements are essential to the progress and lasting good of the individual and the state. The need of industrial work to supplement the existing school system and to meet fully this educational need, which has developed with the evolution of our industries and commerce, is therefore clear to all who have made a study of this great problem.

The courses now offered in most of our secondary schools do not appeal strongly to the masses because they do not provide for the special immediate needs of the ordinary man. They do not contribute enough of the education needed and demanded as a preparation for his daily practical activities. We must offer to the people of the important industrial classes, industrial work which will help them in their daily labor for securing a livelihood.

Two methods may be used in giving these courses. Either by extending the existing system so that these subjects may be pursued in the present schools, with the more cultural studies or a separate system of schools, given up to industrial work almost entirely, could be established.

Separate schools can never be as good as larger schools with separate courses, giving preparation to a large variety of people, in a number of useful pursuits. It will not be necessary to bring all occupations and all industries into our schools, but the time has come

when many of the more important activities, industrial and non-industrial, must be recognized in our public school system. Boys and girls in such schools will secure a much broader outlook, they will have a greater chance, and be much better qualified, to choose their life work.

Business and commercial departments, agriculture, trade school departments, and course in cooking and household affairs could be offered as a part of every high school course, and thus each occupation followed by a large number of people could be taught in the enlarged high school.

No schools designed to prepare a single class of people could be so well equipped in the important arts and sciences as those dealing broadly with a variety of interests. If each individual was educated in an atmosphere and environment much broader than that of his own sphere he would be much more valuable to himself and the community.

If we undertake to train the children of the farmer or the tradesman in a system of inferior schools, such as separate schools for each industry would be, with little knowledge of, and a less regard for, the affairs or occupations of other people, it would segregate each class and make it narrower, generation after generation. Acquaintance with the work of their fellow men is necessary to a just dealing with, and appreciation of their mode of life and their political problems. The present need, in all the industrial lines, is to educate, not by a system of educational cleavage, but by a system of schools which reflects many interests and gains directly by separate courses.

If separate schools are established for one trade they will be established for another, they will be established for agriculture, for domestic science, for technical work and for commercial lines. This method would soon reduce the present high school, most of them located in small villages and founded to minister to the needs of their community, to college preparatory

institutions with only a few students.

At present the demand for agricultural courses is especially marked. School devoted solely to agriculture would of necessity cover so much territory as to require the students to live away from home. They should not be separated from their homes during the grammar or high school age and be compelled to take long journeys to get to an agricultural school. On the other hand, every farmer's boys or girls should be able to go to the nearest high school and get instruction in farm life, or to prepare them in at least the elements of any industry or profession which they may choose.

Different classes educated separately would also prevent the freedom of choice and flow of individuals, from one occupation or profession into another, which is always desirable for the welfare of the individual and the state. Boys do not necessarily wish to follow the industry of their father and often the most desirable and the most competent of our public men have been brought up in rural life. -

Looking at these various units of our educational system we see that one of the most important movements toward industrial education and progress is the establishment of a system of consolidated rural and village schools. These schools offering courses in agriculture so near the homes of the farm boys and girls, giving them instruction in agriculture, in home economics, and in social and civic affairs, as well as the accepted subjects of general education, will add greatly to their efficiency.

With the changed conditions of country life, and the need of scientific farming, these rural schools need to be consolidated. They thus secure better buildings, better equipment, better instruction and also the industrial education which they are demanding, and which they need so much. That is, by consolidating our rural schools into larger units we will at once provide better conditions for instruction in the general studies and make it possible to add much that relates to the vocations of farming and home making.

Those students of the rural school with a definite aim for a higher education would upon leaving the high school grades of the consolidated school be prepared to enter engineering, scientific, classical, or other courses in colleges and universities. For such students the vocational studies pursued in the consolidated school would be a decided advantage, giving them a broadened outlook, a skillful hand and an observant eye.

In order that the great army of boys and girls in our country homes may secure these benefits of the modern industrial movement in education, the rural school must be consolidated.

If we will combine observation in nature study, and the elements of usefulness and the human relation in the elementary grades of our secondary schools we will prepare the way for the teaching of agriculture in the intermediate grades. If we give students in the intermediate and grammar grades manual and technical work we will prepare them for similar work in the various courses of the high school.

In arranging the work in the grades, it may be better to have the elementary school work end with the sixth grade, especially would this be advantageous for the boys and girls who can not remain in school life to take the full high school course. Subjects that would help them ^{to} find their life work could be offered with the more important cultural studies. Many students, under this arrangement would remain in school much longer and thus enter some specific trade.

In the grammar grades and high school the industrial work could replace, to a certain extent, some of the work now being done in the common branches. About two-fifths of the time now spent upon these subjects could be used to much greater advantage in industrial work. The present grammar course, for example, should be simplified and much more practical writing and composition should be offered. In nearly all of the subjects now offered, a part of the present material should be eliminated entirely from the course, and the remainder made much more practical.

As students advance to the ninth and tenth grades more industrial work should be included in their course. Not less than one-fourth, or more than one-half, of the students time should be spent on industrial subjects which lead to his life work. By thus making the student's life ^{in school} an important part of his whole life it will remain a permanent guiding force, no matter at what point his school life must close.

* The movement for vocational education has directed attention to the aims and work of the existing public school, with a view to appraising the social significance of that work, and particularly its significance with respect to the vocations toward which they point their pupils and what vocational preparation they should offer. With the better facilities for training and the greater freedom of choice for a life work the student will be in need of greater vocational guidance. Hence a conspicuous tendency in educational activity today is the effort to make the school a more efficient factor in shaping the pupils career. While enabling him

* Meyer Bloomfield, -Vocational Guidance.

to appreciate the spiritual and institutional resources and problems of our age, it shall also render him responsive to our economic resources and problems, and in particular, it shall bring home to him the importance and dignity of work of all kinds as the foundation of all individual and social welfare.

Education is no longer a luxury but a necessity. It is not ~~of~~ a privileged few but for the masses. Education must provide not only for the training of special capacities, but for making all conscious of their individual abilities. It should give a broad training which develops both the physical and intellectual being.

Industrial education should aim to give every student that insight which will lead him to make an intelligent choice, of some specific vocation, and aid him in preparing for the highest efficiency in that chosen work.

The problem whether we are to have separate schools of all kinds, established apart from our present system,

or train all classes together and thus secure educational unity must now be solved.

We should certainly maintain a single system of public education giving every young man and young woman, both of the vital parts of a broad education, the one vocational, for efficiency in useful and self supporting work, and the other cultural, for their individual development.

It will take time, new courses of study, new materials, new methods of instruction, a new class of teachers, and a more complicated system; but in this way, only, can we maintain the right unity and democracy in our new plan for public education.

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