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The Development of Technical Education in the Chicago High Schools

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THE DEVELOPMENT OF TECHNICAL EDUCATION IN THE CHICAGO HIGH SCHOOLS

BY

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The author of this thesis was born September 7, 1897. After graduating from the Englewood High School, June, 1917, he entered the Chicago Normal College. Upon graduation he taught Manual Training in the elementary schools. He received his Ph.B. degree at the University of Chicago in 1922. Since that time he has taught in the Chicago High Schools. He is now teaching American History and Civics in the Tilden Technical High School.

PREFACE

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CHAPTER I

INTRODUCTION

The purpose of this study is to trace the development of technical education in the Chicago High Schools from its earliest beginnings, about 1890, to the present year, 1932. By technical education we shall use the twofold definition as given by Mr. Albert G. Bauersfeld, Director of Technical Studies in the Chicago High Schools, in his annual report for 1928:

> General manual arts if primarily a training for appreciation of things industrial, good for all pupils without regard to their probable future work in life, - a culture, a discipline, and that vocational manual arts if primarily a training for efficiency in preparation for entrance into some specific life activity, which the pupils expect to follow (15:10).

Since technical work in the Chicago High Schools is really a composite idea of a number of educational movements throughout the country, a brief resume of its development in the United States will be given. Special emphasis will be given to the three technical high schools for boys located in the three geographical districts of Chicago; on the north side, the Lane Technical High School; on the west side, the Crane Technical High School, and on the south side, the Tilden Technical High School. Since one out of every two boys in all our public schools is taking courses in shop or drawing this phase of education is of vital importance.

After the historical development of technical education in the United States has been traced, the philosophy of this type of education will be considered. The incorporation of technical training into the traditional academic curriculum has been an uphill battle and even today is being vigorously challenged. Is technical training an integral part of our modern educational system? Our large technical high schools, with their expensive equipment, should not perhaps be maintained unless it can be clearly shown that their existence is justifiable and essential. Is technical education for vocational purposes clearly differentiated from industrial arts training as part of a general education program?

In Chapter IV the chronological development of technical education in the Chicago High Schools will be studied. What factors caused the introduction of manual training into the traditional curriculum? Where and when was this type of training first offered? When were the strictly technical high schools established? When were the two-year vocational courses established? What facilities do the high schools offer for the industrial arts training for girls? The completion of the six million dollar Lane Technical High School will offer to Chicago students a building and shop facilities equal to, if not surpassing, any in the United States.

An attempt will be made to discover the significant

changes in the curriculum and what factors have produced these changes. What were the objectives in the early period, how were they modified, and what are the present objectives? Suggested modifications, in view of present demands, will be made after the data have been collected and analyzed. Are courses standardized and inflexible? What is the holding power of our two year vocational courses and do they need modification? Should the controlling purpose be developmental and appreciational or formal training and prevocational? What happens to graduates of our technical schools? Is their technical training of any value in finding employment? Is there any study of available positions before the courses are offered?

The next part of the study will be the teaching staff. How were teachers secured during the early period? What was their training and preparation? To what extent have the qualifications become more rigorous? Have they sufficient academic training as well as specialized training in their chosen field?

After the study is completed an attempt will be made to evaluate the material and make recommendations. The local situation, however, must be carefully studied and a very careful analysis made. From time to time, as conditions demand, a survey should be made and the results utilized. The Strayer report of 1932 was the first serious attempt to do this.

CHAPTER II

THE DEVELOPMENT OF TECHNICAL EDUCATION IN THE UNITED STATES

Technical education in the Chicago High Schools is a composite idea of a number of educational movements throughout the United States. In this chapter an attempt will be made to trace the development of technical education in the United States. Just how, and where, and when did technical education get its impetus? What caused its early introduction into the Chicago schools? This investigation will serve as a basis for an intensive study of the situation in the Chicago high schools.

Manual training was first recognized as a valuable feature of school work in European countries. Interest in the idea of manual training developed early in France. As early as 1870, constructive work was made an important part of the curriculum. In Germany and England the movement was given encouragement. It was Sweden, however, that took the most active part in the development of handwork, between 1880-1890. The Sloyd System gained headway, and provided a well-organized scheme of educational tool work for boys between twelve and fifteen years of age, aimed mainly at the production of domestic utensils. This movement later has its effects in the United States.

Colleges of engineering in the United States, did not,

in the early period, provide an efficient system of school instruction in the cultivation of skill in the use of tools. Students having received their academic training had to supplant this with years of apprenticeship. President Runkle, of the Massachusetts Institute of Technology, was in search of a system that would give adequate training in the use of tools, yet not detract from the regular work:

> Can shop-work instruction be devised of sufficient range and quality, which will not consume more time than ought to be spared from the indispensable studies? (29:7)

Runkle visited the Centennial Exhibition in Philadelphia in 1876 and became vitally interested in the exhibit of the Imperial Technical School of Moscow. They seemed to have what he was looking for. The system had been worked out by Della-Vos, the director of the school. The new plan was that of analyzing work-shop operations into their elementary processes and arranging these in a graduated series and making them the object of systematic drill by the student. Instruction, not construction, was the chief aim. Commenting on the new type of instruction, Runkle said:

> Russia, for the first time, has built up a school for instruction - not construction, but instruction in the use of tools. We think they make this instruction just as systematic as our instruction is in mathematics, chemistry, drawing, or any other subject (22:159).

This training was not only professional but part of a scheme of general education. Enthusiasm became aroused and interest developed by the untiring efforts of Runkle. As David Snedden

says: "The School of Mechanic Arts was established March 17, 1876" (31:6). This school marks the beginning of technical education in the United States and the first stage in a period of discussion and experimentation which is still running its course.

The movement soon spread from conservative New England to St. Louis in the West. The leader in this movement was Calvin M. Woodward, Professor of Mathematics and Dean of the Polytechnic School at Washington University. He was extremely interested in the new type of education. His keen interest and encouragement led to the founding of the St. Louis Manual Training School, financed by certain business men of the city. This school was founded June 6, 1879, in connection with Washington University. This was the first secondary school in the United States with a curriculum emphasizing training in manual arts. Its supporters seemed to have in mind a more efficient training for industrial life, but Woodward considered this new type of education an important factor in general education. The St. Louis Manual Training School was a completely equipped high school, giving instruction in various lines of shopwork and in mechanical drawing as well as in the regular secondary school subjects, with the exception of the classics. The work of this school attracted wide attention and soon led to the rapid organization of similar schools in other large cities:

In Chicago, Toledo, Cleveland, and Cincinnati privately

supported schools were organized from 1884 to 1886, and public manual training schools established in Baltimore in 1884, and Philadelphia in 1885 (27:125).

Manual training was installed in the Omaha Schools in 1886:

> The high school was retained with all its features, a manual training department being simply added, the exercises of which all the high school pupils were permitted to attend. A graduate from the Manual Training School attached to Washington University, St. Louis, was secured as teacher (22:164).

Popular interest seemed to increase in the United States throughout the eighties. Manual training was adopted in reform schools and a demand for public support became urgent. While the leaders, Runkle, Woodward and others, did not favor substituting vocational for cultural education, they pointed out that manual training constituted a valuable preparation for any form of skilled work. They claimed that it satisfied the creative impulse of the boy. It taught respect for manual labor and helped elevate the social status of the working class. It filled that serious gap in general education.

This type of education has developed an institution purely American:

> In other countries the introduction and spread of manual training has been confined to the elementary school, and no institution exists in Europe of a purely educational character that represents any parallel to the comprehensive and costly equipment of these schools (27:126).

The Sloyd System was the first system of manual instruction to receive world-wide recognition. Students from all parts of the world studied this new system of manual education at Naas, Sweden. The Swedish Sloyd System was brought to the

attention of American educators by Professor John M. Ordway, director of the School of Mechanic Arts at Boston, where the Russian system got its impetus. The peasant home industries or sloyd were gradually losing ground because of the factory system. Otto Salomon, Director of Sloyd Instruction, became convinced of the value of handwork as a means of general education. He carefully worked out this new system. The main features were:

(1) The mental and physical development of the child were emphasized.

(2) The pupil was restricted to the making of complete exercises valuable for their usefulness and beauty. (This was in direct contrast to the Russian system where instruction, not construction, was emphasized.)

(3) The knife was the first and fundamental tool.

(4) The instructor must be thoroughly trained.

In 1888 the Sloyd Training School was established in Boston under the patronage of Mrs. Quincy Shaw. The director was Gustaf Larson, a former student under Salomon and the leading champion of the system in America. The Sloyd System was considered superior to the Russian System in its adaptation to the interests of school children.

Another attempt at a solution of the problem of handwork in general education is the correlation of hand training with art and nature. The Philadelphia Public School of Industrial

Art was founded in 1880 with this idea in mind. The work of the Philadelphia Manual Training School was founded in 1880 with this idea in mind. The work of the Philadelphia Manual Training School was distinctly different from the St. Louis Manual Training School founded by Woodward. The main feature of the Philadelphia school was the important emphasis placed upon the aesthetic side of the work. Although in its development manual training has been modified by existing conditions and demands, some form of manual training seems to be an integral part of general education. No doubt no stable, inflexible idea is possible. The mental and physical development of the child, the demands of society, and industrial changes, all need careful consideration in formulating any policy.

After 1890 there came renewed agitation both by schoolmen and industrial leaders for a "real" vocational education for the industries. When manual training was first introduced, its advocates had insisted that the chief purpose was general education. They had to do this because the introduction of the trade idea was frowned upon. Now they were ready to show that manual training had real vocational value. Out of it came a greatly enriched industrial arts quite different in content and method from much that had gone before. School shops were more carefully laid out. More and better machinery appeared and the courses became richer in technical information. The industrial arts work now found in the better schools is no longer merely

manual training (woodwork) but is an enriched study through class work, library work, factory visitation, and shop work. Today the industrial arts or "manual arts," as they are frequently denominated, include machine-shop work, electric wiring, auto mechanics, furniture construction, pattern making, foundry work, printing, plumbing, "home mechanics," and various other types of shop work. These enriched courses created a new interest and added a real incentive for the pupil.

Looking back over the whole movement of technical education in the United States on the high-school level, we can observe the following trends: The Russian System aimed simply at instruction in handwork. Uninteresting, abstract sets of exercises developed perhaps a real manipulative skill, but American boys soon lost interest in making difficult joints in woodwork. There soon appeared a new type of handwork, however, which was eagerly seized upon by the Manual training teacher. This was the Sloyd movement. Here the same skill and effort were required, but the pupils were permitted to construct useful objects. The pupils still received <u>instruction</u>, but <u>construction</u> was also allowed, thus appealing to the interests of the pupils. The art-crafts movement, following the Sloyd method of teaching, aimed at the correlation of hand training with art and nature. Important emphasis was placed upon the aesthetic side of the work. While schoolmen and industrial leaders now recognized the educational value of handwork, they

now began to proclaim that it was of too general a nature and had little vocational value. And so the industrial-arts movement was begun, aiming to make the handwork a "real" vocational education for the industries. Technical education has gradually developed from a modest beginning until it now occupies an important place in our present scheme of education. In its evolution controversy and perhaps discouragement have beset it, but throughout its history its facilities have grown and public opinion is generously supporting it. In appraising the best type of modern high schools of industrial arts, Professor Mays lists the following characteristics:

> (1) A large variety of shops representing as large a range of industries as practicable in any given local situation; (2) equipment representative of the best modern industrial practices; (3) the production of marketable 'projects' made as far as practicable, by modern factory methods of production; (4) the careful study through special assignments, lectures, exercises, etc., of modern industries and many of the economic problems of industry, such as sources of supplies of raw materials, markets, transportation, labor, capital, etc; (5) the study of industrial occupations, considering the significance of the various industrial trades and professions, the numbers engaged, the remuneration, training requirements, working conditions, etc.; (6) well trained, college-educated teachers; (7) the general recognition of the value of the courses expressed in terms of full academic credit toward graduation (25:196).

The first high school in Chicago to offer courses in manual training was the English High and Manual Training School during the years 1893-1894. This school offered a three-year course in technical work. The Sloyd movement left its imprint here. The course aimed at actual completion of small objects, not simply training in instruction and developing of skills.

In the early period this type of work seemed to meet an urgent need. The Committee on English High and Manual Training School gave the following report in June, 1894:

> The total enrollment for the year ended was 268, the average attendance 226. Of the 51 men graduated in June, 1894, 30 said they would not have attended were it not for the Manual Training courses (3:113).

The development of manual training from 1894 to the present year, 1932, will be traced as the study gets under way. Much opposition will be encountered, as Mr. Bauersfeld, Director of Technical Work in the Chicago High Schools, says in his annual report:

> During the promotion stage of Federal Aid for Vocational Education the enthusiastic promoters of the Smith-Hughes bill denounced all types of shop instruction that did not directly lead to the learning of skilled trades (15:10).

To meet this demand there have developed the manual-arts and the vocational courses. In order to differentiate, the following definition has been given by Mr. Bauersfeld:

> General Manual Arts if primarily a training for appreciation of things industrial, good for all pupils without regard to their probable future work in life - a culture, a discipline - and that Vocational Manual Arts if primarily a training for efficiency in preparation for entrance into some specific life activity which the pupils expect to follow (15:10).

In this chapter I have attempted to give a brief resume of the development of technical education in the United States as a necessary requisite for an understanding of the Chicago situation.

CHAPTER III

THE PHILOSOPHY OF TECHNICAL EDUCATION

When the sponsors of the manual-training movement advocated its inclusion in the traditional academic curriculum they met with opposition. The educators of the time dreaded the taint of materialism or commercialism in the schools. The leaders of the new type of education were compelled to clarify the objectives of manual training. They declared that the purpose was not utilitarian nor vocational, but that it was a vital part of a general education program. The Secretary of the Massachusetts Board of Education in 1899 made the following comment on the new type of training:

> Why should not a system of education hold some close and carefully thought out relation to important sections of the world's constructive activity, as to those other sections where law, medicine, scientific attainment, and literary culture play each its active part? Then there is the boy who must work for a living. Should not a part of his education, at least, recognize more fully than in the past the primal law that by the sweat of his brow he must earn his bread? (42:1).

If manual training was to be part of the pupil's general education, skill in the use of tools was not to be the primary objective. Colonel Francis W. Parker took a vigorous stand against trade instruction and argued that manual training should not degenerate into the trade instruction of a mechanic. He emphasized the idea that the aim should not be skill, but function. Taking a positive position on this, he declared:

There are two aims in education which may be traced in history. The one is education to prove a dogma, to establish a hierarchy, and to use the schools as a means of making subjects. The other is education to set the human spirit free. Even in this country of ours liberty seldom enters the classroom. Marks of the old are all about us here. We see them in the tyrannical school boards, in the heads of school systems who insist on having uniformity - uniformity is absolute tyranny; we see it in the supervisers who demand that stated kinds of work be done on certain days or hours throughout the schools of a city. This, too, is tyranny and we, in this country, think we have to bow to it. To put down a course of study and say that every teacher shall follow it is tyranny. Manual training is the youngest child of our educational work. Shall we allow this tyranny to crush it?

The influence from abroad is all in that direction. The Russian system comes from a country where all is tyranny; the purpose of education is to make subjects. What is left out? The moral. The child does not know that the thing he is making has any use. Consider the difference between a boy's doing things he knows he must do, and making things useful in his home or his school. Your aim should not be skill, but function (43:172).

The Russian system, emphasizing "instruction" in the use of tools, gradually was abandoned. Then followed the Sloyd system, emphasizing the "construction" of useful articles for the home and school. The leaders of the manual training movement made use of both theories and modified them to gain to some extent the advantages of both.

From the beginning, manual training was designed as part of one's general education rather than as something specifically vocational. During the early period the advocates of manual training made exorbitant claims as to the benefits of hand training. Modern psychology has disproved many of these claims. The following quotation is typical of the exaggerated, general-

ized statements of many sincere promoters of the new type of hand training:

What does Manual Training mean? It means that the budding power of a superintendent of construction may begin to unfold in the child while in the elementary school. It means that hundreds of life's plan and purpose are determined by touching the mainspring of the child's interest. It means that the boy or girl gets a broader, more practical notion of the value of personal service. It means a physical exercise accompanied by hard thinking and reasoning with concrete things.

Manual Training furnishes an indispensable part in any complete education, because body, mind and soul are affected directly or indirectly by Manual Training when properly presented (39:701).

Enthusiasm for the new type of training led many educators and school officials to foster such unwarranted claims. Manual training did, no doubt, enrich the traditional academic curriculum, but its value was as yet not thoroughly tested.

The incorporation of manual training into the curriculum of the Chicago High Schools will be discussed in Chapter V. As in other parts of the country, the strictly vocational objective was discouraged. Manual training was to be a part of general education. This was clearly stated in the Superintendent's report of 1908:

It cannot be compared with the specializing trade school in Germany, and it is questionable whether both systems can be maintained at the same time without detriment to the one or the other (8:22).

As the scope of manual training developed there arose opposition from certain groups who contended that the aim should be vocational. Many well-intentioned individuals believed that

efficient training for the mechanical trades was the primary objective. In 1913, after the manual-training work had been in operation for little over a decade in the Chicago schools, the Supervisor of Manual and Technical Training in the Chicago High Schools made it very clear that the technical training in the school was not aimed to prepare skilled mechanics for the trades. He declared that we should view the work in a broader sense:

> In some quarters the idea seems still to hold that the aims of industrial education be limited to the equipment of present and future generations of young mechanics with such weapons as will enable them to out-distance and be victorious over all rivals. We should, however, look at it from a broader viewpoint - the equipment of all for a complete living, the providing of the opportunity for all to acquire a knowledge of the relationship in which they stand in the community, and the skill to perform accurately the duties which these relationships demand. We must cease to regard technical education as an isolated branch of education by studying all the relations which it bears to the larger order of which it forms a part (12:250).

While the leaders in the manual-training movement were unwilling to push too strongly the vocational merits of this type of work, they did, on the other hand, make exaggerated claims as to the benefits as part of general education. For their own protection, they realized they should not make the utilitarian objective too obvious, but rather the general, disciplinary objective should be cited and promulgated. Modern psychology has shown this idea to be more or less erroneous. Commenting on the disciplinary value of technical training, David Snedden makes the following significant statement:

> More open to criticism has been the 'disciplinary' theory which even yet controls heavily - with now being admitted as

such - in manual training for upper grades and high schools. The very words 'manual training' reflect the prominence of this theory, the implications being that through some definite exercises with tools the 'hand' can be trained for a large variety of useful works of life.

We are forced to the conviction that there is little foundation for what is commonly held as the disciplinary theory in education - that some specific forms of training in mental or physical skill or in moral habit will 'transfer' or 'spread' and thus give foundations for the powers to be employed later (32:465).

During the last decade there has been a demand for a more enriched curriculum in the technical departments of our high schools. Although the friends of manual training had been insisting that the chief purpose of the work was general education and not specific vocational training, they had felt, but had not stressed, that the manual work made an important contribution to the preparation of boys for industrial vocations. Although there is still much discussion as to the merits of this claim, the shop-work has benefitted immeasurably. The term "Manual Training" is being displaced by the caption "Industrial Arts." Manual training during the early period simply meant handwork in wood. It now includes such subjects as printing, electricity, foundry, forge, aeronautics, and radio. These subjects are not now considered as isolated branches, but attempts are being made to enrich each subject by class discussions, library work, and factory visitation. More time is being given to shop-work and efforts are being made to secure properly trained teachers from the trades.

With these improvements, with the serious attempt to make the shop-work closely resemble that of the trades, the primary purpose still remains, namely, that the training is still part of a general education. Any attempt to turn our technical schools into trade schools would be vigorously challenged. Sentiment seems strongly opposed to the establishment of trade schools in public education, denying young people the right to a general education. The following quotation is typical of the feeling against the establishment of separate trade schools to which certain groups of young people are relegated:

> It behooves school people to note that the campaign is once more being vigorously waged to create, if possible, a group of schools distinct from the ordinary high schools for the training of certain groups of adolescents. The significance of this campaign should be fully realized. It is the firm conviction of the present writer that a group of technical schools which lack the facilities for general education would be utterly out of harmony with the ideals of American civilization (45:10).

Efforts to shunt certain groups into trade schools would, no doubt, meet with much opposition from parents who feel that as taxpayers they have a right to demand for their children the opportunity for a high-school education and perhaps a college education. In a recent address, William J. Bogan, Superintendent of the Chicago Schools, and one of the leading promoters of technical education in Chicago, made the following statement upholding our present type of technical training:

> Will the working man be satisfied with a choice between (1) a narrow education for leisure; and (2) a narrow training for work? The signs seem to indicate that the self-respecting, self-supporting man will wish his children to have a third choice a judicious mixture of science, technology, machinery, and

academic subjects (38:551).

The graduates of our technical high schools thus secure sufficient technical training for the "non-commissioned officers of industry," yet the academic training is not denied to those who wish to extend their education to the college level. A recent report of a special committee of Armour Institute, following a research into the personnel needs of 60 nationally known industried, reveals some interesting facts. The personnel heads of important industries hiring technically trained students were interviewed, asking them for definite information concerning their experience with technically trained workers. Among the concerns investigated were the Acme Steel Company, the Atchison, Topeka and Santa Fe Railroad, the Central Scientific Company, General Electric, John Griffiths and Son Company, Illinois Tool Works, International Harvester, and the Illinois Bell Telephone Company. The interviews with the personnel heads of the industrial concerns cited in the report, show great unanimity among employers of technical men as to what is wrong with current technical educational methods. According to Mr. James D. Cunningham, Chairman of the committee, the demand was for more diversification rather than specialization:

> For instance, it would be natural to suppose that specifications for men for the Western Electric Company would call for men trained in this or that electrical engineering specialty. But on the contrary, the call was for a more generalized technical training. It appears that most large industrial concerns prefer to take men with broad technical and scientific foundations and train them themselves for the local industries' special demands (41:10).

Although this report deals with the highly specialized college trained individual, it does give us some interesting data which could perhaps be wisely utilized by those responsible for the efficiency of our technical high schools. The establishment of trade schools with much specialization, and the elimination of the general education might be a step in the wrong direction. These industries in our community hiring many graduates are asking for more diversification, leaving the specialized training to the particular industry. Our technical high schools are at present giving the diversified training and should perhaps continue along this line rather than change to a highly specialized training for the trades.

Vocational training in the high schools is being vigorously challenged by certain groups who contend that this type of training should not be given in the general high school. Theylook upon vocational subjects as fads and frills wasting the pupils' time, and argue that vocational subjects should be given only in trade schools. They believe in adhering to the traditional curriculum. Commenting on the report of the Carnegie Foundation on Vocational Education, Poteat says:

It is stated briefly, the curbing of the menace of vocationalism, of the stifling of the high school course by the introduction of band, orchestra, journalism, stenography, domestic science, aesthetic dancing, movie scenario writing, et cetera, et cetera, ad nauseam. The Foundation sees that the effects of this hash on the mind of the growing child are tragic; and also that vocational training offered in the high schools has so little of the sharp, accurate responsibility of the well-trained technician, and is so poorly related to the

facts and circumstances of these vocations that it is in great measure an educational farce. In other words, that high school vocational teaching not only compromises the child's intellectual development, but fails to accomplish the one thing it promises to accomplish. The Foundation properly suggests that vocational subjects should be taught in trade schools (44:674).

Poteat condemns the type of vocational training given in out high schools and lists the following arguments:

Vocational training in the high schools is, in the opinion of the writer, a tragic and criminal mistake,

First, because as suggested above, it does not really prepare for the vocations. Second, because it offers the student an easy short cut through high school. Aesthetic dancing and scenario writing are more interesting and not so difficult as mathematics, Latin, and history. Third, because the student is inoculated with the poisonous notion that education means learning a few facts, or acquiring a bowing acquaintance with a trade. Fourth, because it permits the student to pinch here, taste there, nibble younder, waste precious time in piddling and dabbling which ought to be spent in hard, unremitting study of those great fundamental subjects which have always been recognized as mind-trainers and soul builders.

Finally, because it trains for self during the period when training for service ought to be the paramount consideration (44:675).

Perhaps a clear-cut distinction should be made between industrial arts courses which aim to train specifically for the trades and those courses which form an essential part of a general education program. In some quarters there still seems to be opposition to including industrial arts subjects in the curriculum of the traditional high school. According to the Biennial Survey of Industrial Education in the United States, 1928-1930, industrial arts training is now generally accepted as an essential part of the general education program,

but there still remain many problems calling for careful study.

While industrial arts training is now quite generally accepted as an essential phase of the general education program, the specific courses and subjects to be included for instruction, specific course objectives, methods of instruction, the school year in which the various units of work shall be offered, and the question of requiring some industrial arts work of all boys are still the subject of much discussion (28:19).

Industrial arts is considered a general education subject, governed by the same principles as govern the purpose and organization of courses for general education training. Specific objectives for industrial-arts courses must be set up and agreed upon. Industrial-arts courses as part of a general education program will not have the same objectives as industrial arts courses which are strictly vocational. Failure properly to differentiate the specific objectives has perhaps led to much misunderstanding and opposition to industrial arts courses.

CHAPTER IV

THE DEVELOPMENT OF TECHNICAL EDUCATION IN THE CHICAGO HIGH SCHOOLS

Manual training in the Chicago High Schools was first sponsored and financed by private enterprise. After proving its worth and demonstrating that it was an integral part of an up-to-date educational system, this type of work was taken over and financed by the Chicago Board of Education. In order to keep the important trends in mind and to clarify the presentation the following outline is given. This presents in chronological order the outstanding developments of technical education in the Chicago High Schools.

Feb. 24, 1884 -- The Chicago Manual Training School opened, established by the Commercial Club of Chicago.

Sept., 1890 -- The English High and Manual Training School opened on Monroe Street, near Desplaines Street, by the Chicago Board of Education.

March, 1897 -- English High and Manual Training School building destroyed by fire. School moved to a five-story factory building at 128 South Jefferson Street.

May 25, 1897 -- The Chicago Manual Training School incorporated by the University of Chicago.

June, 1901 -- The Chicago Manual Training School moved to a new building at University of Chicago.

1902-1903 -- Name of English High and Manual Training School changed to Crane Manual Training High School.

Sept., 8,1903 -- The English High and Manual Training School moved to new building at 2245 West Jackson Boulevard.

Sept., 1905 -- Hoyne Manual Training High School opened at 45 East Illinois Street for boys of North Side.

Sept., 1905 -- Classes in Manual Training opened at South Division High School for boys of South Side.

Sept., 1908 -- Lane Technical High School opened at Division and Sedgwick Streets.

Sept.,23,1908 -- Name of Crane Manual Training High School changed to Richard T. Crane Technical High School, its present name.

Sept., 1909 -- Classes in Manual Training (Wood-work and Drawing) opened in many academic high schools.

Sept., 1910 -- Two-year vocational courses established.

Sept., 1912 -- First two years of technical work in academic high schools; last two years of technical work in the strictly technical high schools.

Sept., 1911 -- Lucy Flower Technical School for girls opened.

Sept., 1912 -- Prevocational schools opened at Lake, Lane, and Crane Technical High Schools.

Sept., 1914 -- Carter Harrison Technical High School finished, first building in Chicago to be used as a technical school for both boys and girls (Marshall Boulevard and West 24th Street).

June 23, 1915 -- Name of Lake High School at 4747 Union Avenue changed to Tilden Technical High School.

1932 -- New $6,000,000 Lane Technical High School and College building under construction.

One of the most active groups in the early promotion of manual training in Chicago was the Commercial Club. As early as 1882 this progressive organization began a concerted drive to receive funds to establish a Manual Training School. Their efforts were rewarded, as one of the earlier accounts relates:

The Chicago Manual Training School Association (members of the Commercial Club of Chicago) was incorporated under the laws of the State of Illinois, April 19, 1883. The corner-stone was laid September 24, 1883; the school opened February 4, 1884 (37:147).

This school was under the directorship of Dr. H. H. Belfield. Under his expert guidance the success of the school was pronounced. Possessing a practical vision as well as an academically trained mind he recognized the value of manual training as an element of general education. Yet he did not wish his school to be a mere trade school. Commenting on this, he said:

> This school is a college preparatory school as well as a superior training school for a life of usefulness. (37:148)

On May 25, 1897, the Chicago Manual Training School was made part of the University of Chicago. The school moved to the University grounds in the latter part of the year 1901. A new building having adequate shop facilities was started June 17, 1903. The Chicago Manual Training School was then combined with the South Side Academy, forming the University High School of the School of Education. Dr. Belfield was made Dean of the combined schools.

As soon as the Chicago Manual Training School had demonstrated its success, pressure was brought to bear upon the Chicago Board of Education to establish such a school. Many influential organizations demanded that the public schools include manual training in the curriculum. The first school

for manual training was established early in 1887. The pupils from the first year classes in the high school received instruction in mechanical drawing and bench work. In his annual report, 1887, Superintendent George Howland makes this comment:

A school for Manual Training was opened early in 1887 on Monroe Street near Halsted. About seventy-five (75) pupils from the first year classes in the high schools, who had their regular studies in the high schools during the morning session, attended this school in the afternoon five days in the week from 1:30 to 3:45.

Under the direction of Mr. Hanstein, with one assistant they received instruction in Mechanical Drawing and the various forms of bench work. The pupils were much interested from the first, and the results of the experiment were all that its promoters could reasonably have expected. The boys became as proficient in the use of tools and in skill to do good work, as they would have done in two or three years of the old home apprenticeship, and undoubtedly found the work of considerable educational value. It would seem that if this department was to become a part of our school system it should not stop here, but should be extended gradually to the second and third year (1:212).

As the number of high schools increased by annexation and as they were very remote from each other, it was impossible to continue the former arrangement by which the pupils attended the high schools during the morning session and the Manual Training School during the afternoon. The English High and Manual Training School was established in September, 1890, in the old Central High School building on Monroe Street near Desplaines Street. This school later developed into the Crane Technical High School and will be discussed more in detail under a separate heading. A three-year course was offered and the school had an enrollment of 259. The building was destroyed

by fire on March 22, 1897, and temporary quarters were secured in a five-story factory building at 128 South Jefferson Street. While the school lacked adequate facilities and properly trained teachers, it nevertheless was a beginning and paved the way for future developments. A constant demand was being made for the establishment of a manual training school on both the North and South sides of the city. In his annual report of 1900 the Superintendent of Schools recommended the establishment of another manual training school:

> As soon as convenient a new High School should be erected on the lot purchased a year ago and the present South Division High School remodeled for a South Side Engligh High and Manual Training School (4:165).

Again the following year the Superintendent of Schools urged the establishment of manual training schools for the North and South sides of the city:

> A modern building with the best equipment and all needful appliances should be erected. Let me again urge the importance of a similar school on the North and South sides (5:204).

While the agitation was going forward for Manual Training schools in the other sections of the city efforts were being made to improve the course of study at the English High and Manual Training School. The three-year course of study was inadequate if the school was to reach the efficiency of other secondary schools of this type. A four-year course was needed with improved shop facilities. This was adopted in 1902. In the 48th Annual Report of the Board of Education, 1902, the

Superintendent felt this to be a real improvement:

With a four years' course we hope to put the English High and Manual Training School on a level with the best secondary schools in the country (6:62).

As the demand for manual training grew and as its educational value became recognized the Academic high schools endeavored to add one and possibly two years of shop-work to the curriculum. Mr. Bauersfeld, the Director of Technical Work in the High Schools for fourteen years, 1918-1932, has said that often the finest grade of work was done in the Academic high schools. Between 1900 and 1905 some few schools were successful in installing some kind of manual training for the boys. Until a building could be constructed, temporary quarters were secured for a manual training school on the North and South sides of the city. In September of 1905 the Hoyne Manual Training High School was opened at 45 East Illinois Street for boys of the North Side. Classes were also opened at the South Division High School, 26th and Wabash, for boys of the South Side. Mr. William J. Bogan was principal of both schools. After one year, classes at the South Division High School were transferred to the Hoyne School and to the Lake High School. The Lake High School later became the Tilden Technical High School. This will be treated later when the history of the Tilden Technical High School is discussed. The Crane Technical High School, located at 2245 West Jackson Boulevard, opened in September, 1903, in a beautiful building costing $331,600.

This provided a new building for the English High and Manual Training School. The Lane Technical High School, located at Division and Sedgwich Streets, opened in September, 1908, at a cost of $750,000. This made possible an up-to-date technical high school for boys of the North Side. As these three technical high schools for boys, namely, the Lane Technical High School on the North Side, the Crane Technical High School on the West Side, and the Tilden Technical High School on the South Side, are given special emphasis in this study, they will be discussed separately at the end of this chapter.

Considering now the manual training courses in the Academic high schools, we will observe a steady growth. One school after another added shop courses. This type of work had an appealing interest to the average boy who liked to use tools and complete a project of his own initiative. Attendance was improved. Speaking on this subject the Superintendent of Schools in 1910 gives the following interesting statement:

> Since the Technical High Schools have been opened it has been experienced that the high school attendance, especially of boys, has increased about 40 per cent. There is every indication that more such schools should be established as soon as possible (9:19).

Although the academic high schools did not offer a full four-year technical course such as was provided by the three technical high schools, they did have manual training classes for boys in wood-work, foundry, forge, and machine shop. The pupil's regular academic training was not seriously interfered

with, and the enriched courses kept many of them in school. By 1909, ten academic high schools had installed manual training courses. In most cases mechanical drawing was given and the shop-work was woodworking. Consulting the report for 1910, we find this statement:

Manual training classes for boys were given in the following schools: Austin, Calumet, Curtis, Englewood, Lake, Lake View, Marshall, McKinley, Medill, and Phillips (1:112).

These schools did not offer a full four-year technical course. Boys wishing to secure this training enrolled at one of the three strictly technical high schools - Lane on the North Side, Lake (later changed to Tilden) on the South Side, and Crane on the West Side.

As the popularity of manual training grew, more schools gradually added this type of training to the other varied courses offered. In addition to wood-work, forge, foundry, and machine shop were given. James E. Armstrong, Principal of Englewood High School, in a special report in 1913, gives the following information:

Sixteen of the twenty-one high schools offer one year or more of Manual Training. The total number of pupils taking the course was 818. The term Manual Training here includes wood-work, foundry, forge, and machine shop (11:254).

These non-technical high schools have since added, in many instances, such courses as printing, auto-mechanics, sheet metal work, electricity, aeronautics, and radio. Such varied courses have been a strong factor in holding boys in school and enrich-

ing the traditional curriculum.

As technical education developed in the Chicago High Schools the main consideration was technical training for boys. The needs of the girls in vocational arts was given little attention and in many instances seriously neglected. In September, 1911, the Lucy Flower Technical High School for girls was established with the object in mind of giving the girls specific training in cooking, sewing, millinery, home management, and other kindred arts. By September, 1914, the Carter Harrison Technical High School was finished, this being the first new building in Chicago to be used as a technical school for both boys and girls. This school was fully equipped to take care of the vocational needs of both boys and girls. In 1915 the name of the Lake High School was changed to Tilden Technical High School. This had been a co-educational school, but it has since changed to a technical school for boys only.

During the last decade the technical high schools in Chicago have expanded and have endeavored to keep in step with advances made in other parts of the country. The courses have been enriched, such new studies as radio and aeronautics being added to the curriculum. Vocational counselors have been added to the teaching staff. These specially trained teachers devote all their time in advising the high school pupil, helping him find himself, suggesting proper courses and subjects, aiding him in finding employment, and giving special attention to the

problem or maladjusted boy. Advances have been made in administration and supervision. Apprenticeship classes in plumbing and baking have been opened at the Lane Technical High School. Technical training seems to be an integral part of a modern, up-to-date educational system. In March, 1932, over 50,000 boys were enrolled in courses in shop or drawing. Such a large number would seem to indicate that technical training is considered to be an important element in the training of our pupils.

The enrollment of boys in technical subjects in the Chicago High Schools is shown in the following table:

TABLE XII (35:10)

ENROLLMENT OF BOYS IN TECHNICAL SUBJECTS
CHICAGO HIGH SCHOOLS, MARCH, 1932

Shop	Enrollment	Drawing	Enrollment
Woodshop 1B	2,454	Mechanical Drawing Sem.1	4,288
Woodshop 1A	2,340	Mechanical Drawing Sem.2	5,673
Pattern Making 2B	1,068	Mechanical Drawing Sem.3	3,403
Pattern Making 2A	432	Mechanical Drawing Sem.4	3,329
Forge 2B	566	Mechanical Drawing Sem.5	1,116
Forge 2A	1,333	Mechanical Drawing Sem.6	2,345
Foundry 2B	1,037	Mechanical Drawing Sem.7	1,535
Foundry 2A	1,079	Mechanical Drawing Sem.8	825
Machine Shop	3,714		
Electric Shop Sem.1	1,332	Architectural Draw.Sem.1	331
Electric Shop Sem.2	918	Architectural Draw.Sem.2	195
Electric Shop Sem.3	455	Architectural Draw.Sem.3	570
Electric Shop Sem.4	886	Architectural Draw.Sem.4	669
Auto Shop Sem.1	1,471	Architectural Draw.Sem.5	412
Auto Shop Sem.2	1,013	Architectural Draw.Sem.6	335
Auto Shop Sem.3	665	Architectural Draw.Sem.7	402
Auto Shop Sem.4	393	Architectural Draw.Sem.8	303
Aviation Sem.1	398		
Aviation Sem.2	313		
Aviation Sem.3	88		
		Total	25,731

TABLE XII (continued)

Shop	Enrollment
Aviation Sem.4	63
Aircraft Engines 3A	100
Print Shop. Sem.1	1,518
Print Shop Sem.2	915
Print Shop Sem.3	392
Print Shop Sem.4	371
Linotype	311
Presswork	333
Total	25,958

As the three technical high schools for boys (the Lane Technical High School on the North Side, the Crane Technical High School on the West Side, and the Tilden Technical High School on the South Side) are given special consideration in this study, a summary or brief history of these three schools is presented in the following paragraphs.

The Crane Technical High School

After the Chicago Manual Training School had been in operation for several years, the Chicago Board of Education established the English High and Manual Training School in September, 1890. Mr. James F. Claflin was appointed principal. Quarters were secured in the old Central High School building on Monroe Street near Desplaines Street. Consulting the records, we find this comment:

The new school had a three-year course, and about one hundred thirty (130) pupils, as many as could be conveniently accommodated in its quarters, so that additional buildings were needed for the shop work for the years 1891 to 1892 (20:3).

Many pupils attended their own high school during the morning session and the English High and Manual Training School for the afternoon session.

In 1894 Mr. Albert H. Robinson became principal of the English High and Manual Training School and efforts were put forth to secure more adequate accommodations and better equipment. During the Spring of 1897 the progress of the school was given a temporary setback when the building was destroyed by fire. Temporary quarters were secured in a five-story factory building at 128 South Jefferson Street. After the death of Mr. Robinson in 1900, Mr. William Bartholf was appointed as principal. With the addition of a two-year Junior College course the school was indeed making steady advances. One of the outstanding leaders in the promotion of technical training in the Chicago schools was Richard T. Crane. His moral and financial support was generously given. And so in 1902, in honor of this man, who gave technical education a real stimulus in the Chicago schools, the name of the English High and Manual Training School was changed to the Richard T. Crane Manual Training High School.

After constant pressure and agitation a new building was finally secured, fully equipped and having suitable accommoda-

tions for an increased enrollment. On September 8, 1903, the school moved to its new quarters at 2245 Jackson Boulevard. The beautiful building was erected at a cost of $331,000 and provided accommodations for 1020 pupils. The name of the school was again changed on September 23, 1908, to the Richard T. Crane Technical High School, its present title.

Some evidence of the steady advance in attendance may be seen from the following statistics:

TABLE I (21:2)

AVERAGE DAILY MEMBERSHIP OF THE CRANE TECHNICAL HIGH SCHOOL

Year	Average Daily Membership
1890-1891	111.6
1900-1901	577.5
1910-1911	893
1920-1921	1,864
1930-1931	3.781.6

The Lane Technical High School

With the completion of the new Crane Technical High School building for the boys of the West Side, efforts were put forth to give the boys of the North and South sides the same type of facilities. Mr. William J. Bogan was very active in securing a real technical school for the North Side of the city. The Hoyne Manual Training High School opened in September, 1905, in the Hoyne School building at 45 East Illinois Street.

Classes in manual training also opened at the South Division High School for boys of the South Side. Mr. Bogan was principal of both schools. Classes at the South Division High School were discontinued after one year and the pupils transferred to the Hoyne and Lake High Schools. The Lane Technical High School was originally named the Lyman Trumbull Manual Training High School. In December, 1907, the name was changed to the Albert G. Lane Technical High School, in honor of a former Superintendent of Schools who so unceasingly fought for the promotion of technical education in the Chicago High Schools. By September, 1908, the new building was completed and the school moved to its present site at Division and Sedgwick Streets. With the completion of this beautiful building, two of the proposed three technical high schools for the city had finally been established. A site for the third technical high school was secured on Stony Island Avenue between 61st and 63rd Streets.

The Report of the Superintendent in the 53rd Annual Report to the Board of Education gives us some idea of the new school for the North Side of the city:

> The school had accommodations for 1600 students. Most of the shops were located on the ground floor. Class rooms, science rooms, drawing rooms, lecture and laboratory rooms, were located in the other three floors. The following shops were fully equipped: Woodshop, electric shop, foundry, and forge (7:22-23).

During its short period of existence, the Lane Technical High School has had a phenominal growth. It has become necessary to establish several branches nearby to take care of the in-

creasing enrollment. A glance at the following figures will reveal to some extent the amazing growth of the Lane Technical High School:

TABLE II (21:3)

AVERAGE DAILY MEMBERSHIP OF THE LANE TECHNICAL HIGH SCHOOL

Year	Average Daily Membership
1905-1906	83.7
1915-1916	1,840.3
1925-1926	3,879.2
1930-1931	5,911.2

The Tilden Technical High School

Superintendent of Schools Albert G. Lane had predicted in 1892 that there would some day be three technical high schools for boys in the Chicago High Schools. Chicago does now have these schools as he prophesized. The Lake Public High School opened September, 1889, at 4747 Union Avenue. It offered a free high school education for both boys and girls. Shop courses were gradually added until 1912 when it was officially designated as the Lake Technical High School. The present name, Edward Tilden Technical High School, was adopted June 23, 1915. With the opening of the new Lindblom High School in 1919, the girls were transferred from Tilden. The new addition to Tilden was completed in 1925 and enabled the school to take care more adequately of the increasing enrollment. The Tilden

Prevocational School is located at 65th and Union Avenue.

Enrollment at Tilden has increased so rapidly that it has become necessary to establish branch schools for the entering freshmen. With the new Board ruling in effect in September, 1932, that all grammar school graduates must either enter junior high school or a technical high school, the housing problem will be an intricate one.

The following table shows the average daily membership:

TABLE III (21:4)

AVERAGE DAILY MEMBERSHIP OF THE TILDEN TECHNICAL HIGH SCHOOL

Year	Average Daily Membership
1889-1890	191.0
1899-1900	298
1909-1910	699.3
1919-1920	722.7
1929-1930	3,987.9
1930-1931	4,771.7

CHAPTER V

THE CURRICULUM

Some reference was made to the adoption of the various technical courses in the Chicago High Schools in Chapter IV. Before considering the curriculum of the technical schools permit me again to refer to the following data:

1892 -- Adoption of three-year course at English High and Manual Training School.

1902 -- Adoption of four-year technical courses.

1910 -- Adoption of two-year vocational courses.

1912 -- Establishment of prevocational schools.

When the advocates of manual training demanded that some form of hand work be included in the high school curriculum there was a fear that the traditional high school with its academic program might degenerate into a mere trade school. The sponsors of the new type of education replied that this was not the purpose of their program, but that hand training was an essential part of one's general education. It enriched the academic program and education became more vital and interesting. Dr. H.H. Belfield, director of the Chicago Manual Training School, answered his critics with the following significant statement:

> The Chicago Manual Training School is a college preparatory school, as well as a superior training school for a life of usefulness (37:148).

The course of study at the English High and Manual Training School, adopted August 17, 1892, is presented in the following table:

TABLE IV (2:287)

COURSE OF STUDY - ENGLISH HIGH AND MANUAL TRAINING SCHOOL - ADOPTED AUGUST 17, 1892

First Year

Algebra (4)
Zoology, 24 Weeks (4)
Botany, 16 Weeks (4)
American Classics (3)
Composition and Letter Writing (1)
Free Hand and Mechanical Drawing (5)
Use of wood-working tools in carpentry, joinery, cabinet work, wood turning, and pattern-making (10)
Talks on wood as a material

Second Year

Geometry (3)
Physics (3)
General History (3)
English Classics (2)
Composition, Letter Writing, and Business Forms (1)
Mechanical and Free Hand Drawing (5)
Use of iron-working tooks in forge and foundry (10)
Talks on iron as a material

Third Year

Trigonometry and Higher Algebra (3)
Chemistry (3)
Civil Government and Political Economy (3)
English Classics studied Rhetorically (2)
Composition (1)
Mechanical or Architectural Drawing with weekly free hand sketches (5)
Machine-Shop Work, Management and Care of Machines (10)
Talks on machinery and its work

The school offered a three-year course permitting sub-

jects of a practical nature yet not neglecting the college preparatory courses. Three years of mechanical drawing were given in addition to wood-shop, machine-shop, and forge. Three years of English, three years of mathematics, three years of science, and courses in social science were required. After the three-year course had been in operation for several years agitation was begun to improve the existing course by extending it to four years. The three-year course was inadequate if the school was to reach the efficiency of other secondary schools of this type. A full four-year course was needed with improved shop facilities. This was adopted in 1902. Referring to the needed change the Superintendent of Schools declared:

> With a four years' course we hope to put the English High and Manual Training School on a level with the best secondary schools in the country (6:62).

Although the shop work helped considerably to keep many boys in school there were a great many who could not stay in school for four years. There were many reasons for this. Home conditions, lack of interest in school work, and maladjustments drove many pupils from school at the end of two years. And so about 1908-1910 there began a concerted drive to establish two-year vocational courses. The pupils were to be given more time for shop work with the idea in mind to train them specifically for some trade. The time allotted for shop work was to be doubled and the courses were to be modified to permit more elasticity. With this in mind the two-year vocational

course was adopted in September, 1910:

Two-year courses in mechanical drawing, design, carpentry, pattern making, machine shop, electricity, and printing were adopted. (10:90).

These courses have increased in popularity and have held in school thousands of boys who would otherwise have dropped out and drifted aimlessly. At the end of two years the pupils do have a definite, specific training in some particular field. Critics have assailed the two-year vocational schools in that the training is inadequate. This is granted, but with mass education and the increasing expense these pupils are not entirely neglected. Perhaps it would be better to centralize them in separate schools, but the additional expense involved would seem to make this impracticable. Some boys continue on and finish the four-year technical course, but the percentage is very slight. Statistics for 1928 reveal that 4, 449 boys were enrolled in the two-year vocational courses, as shown in Table V.

After the two-year vocational courses had been established the principals of many of our high schools demanded a reorganization of the four-year courses. A special committee, with Mr. Buck as Chairman, was appointed to make an intensive study and to suggest necessary modifications of the technical courses. The members of the committee were as follows: Mr. Stearns, Mr. Armstrong, Mr. Bogan, and Mr. Loomis. Two of the members of this committee were sent to inspect and investigate the

work of the schools in New York, Boston, Philadelphia, St. Louis, and Cleveland. After an intensive study it was felt that two years of technical work should be given in all the high schools. Upon completing two years of technical work, the pupil could then be transferred to either the Lane Technical High School on the North Side, the Crane Technical High School on the West Side, or the Lake High School on the South Side.

TABLE V (15:36)

BOYS ENROLLED IN TECHNICAL COURSES-STATISTICS FOR JUNE, 1928
TWO-YEAR VOCATIONAL COURSES

School	Mech. Dr.	Mach. Shop	Electric	Auto	Print
Austin.....	23		132		27
Bowen.....	27	60	20	86	40
Calumet.....	5	5	12	9	5
Crane.....					
Englewood.....	6	5	39	41	8
Fenger.....	48			85	58
Hyde Park.....					
Lake View.....					
Lane.....	107	116	835	295	188
Lindblom.....	17		135	63	23
McKinley.....	19				59
Medill.....	1				19
Morgan Park.....	4				
Parker.....					

TABLE V (continued)

School	Mech. Dr.	Mach. Shop	Electric	Auto	Print
Phillips.....				28	
Roosevelt.....	49		74		14
Schurz.....	56	31	251	53	56
Senn.....		1		1	3
Tilden.....	35	51	458	360	107
Waller.....	5				35
Total	543	269	1,974	1,021	642

if he desired to continue this type of work. During his first two years of training the pupil could select the school nearest his home. The committee made the following recommendation:

> There will be a marked advantage in this arrangement. A pupil who after two years of technical work in a general high school definitely makes up his mind to continue in the technical course will be transferred to a school were the technical side of all the work will be emphasized, where the work will be more practical.
>
> Your committee therefore recommends that two years, but not more than two years of technical work will be offered in the general high schools, and that four years of technical work be offered in the three high schools which are now designated as technical high schools (11:111).

The three technical high schools referred to in this quotation are the Lane, Crane, and Lake High Schools.

Mr. Bogan, as chairman of a group of principals, vigorous-

ly condemned such a policy as advocated. Keenly interested in developing technical education in Chicago, he saw here a decided step backward. And so in 1913 he made the following recommendation:

> Rescind the rule against admitting pupils of the first and second years to the technical high schools. Experience of two years has proved beyond doubt that the plan referred to is a failure. Pupils will not leave the local schools to enter the technical schools for the last two years of the course as school ties are difficult to break. The technical schools must be their own feeders if they would live. Unless they are allowed to have pupils in the first and second years there will be none in the third and fourth years. Hence it is only a question of time when the rule, if allowed to stand, will eliminate all high school and college students from the technical schools (12:264).

Due to the efforts of Mr. Bogan the technical schools were able to develop and to render an efficient service for the technical student. With a background of four years of technical work, nurtured in a technical atmosphere, the pupil could increase his training in an engineering college or be admirably fitted for the "non-commission" jobs in industry.

Another problem considered by Mr. Bogan was the inadequacy of the training given the disinterested and maladjusted boy of the seventh and eighth grades. Through the efforts of Mr. Bogan prevocational schools were established in September, 1912, at the Lane, Crane, and Lake High Schools. Many of the boys admitted to the "prevo" schools were problem cases. The enriched curriculum with shop work and mechanical drawing gave school work more attractiveness.

The program, with great elasticity, was as follows:

1 period a day - Combination Civics, History, and Geography
1 period a day - Shop Mathematics
1 period a day - English
1 period a day - Mechanical and Free Hand Drawing
2 periods a day - Shop Work

The boys, gathered from the many grammar schools, would have perhaps dropped out of school altogether or at least would have caused the school authorities considerable annoyance. The following table gives us some information, after the schools had been in operation two years:

TABLE VI (13:320)

PREVOCATIONAL COURSES IN HIGH SCHOOLS FROM INCEPTION SEPTEMBER, 1912 TO DATE, 1914

	Crane	Flower	Lane	Lake	Totals
Admitted.....	243	233	467	224	1,167
Left other than by graduation.....	85	94	178	56	413
Graduated.....	72	37	85	90	284
Membership.....	86	102	204	78	470
Entered High School....	41	17	31	25	114
Still in High School...	33	12	23	17	85

Over 1,000 boys entered the "prevo" schools during the two-year period 1912-1914. About twenty-five per cent graduated. This is a high figure considering the type of student. About ten per cent entered high school. The membership was in all instances below fifty per cent. Were it not for the "prevo" schools practically 100 per cent of these boys would have probably dropped out of school, young, and inadequately prepared to take their place in society.

While industrial arts training is now quite generally accepted as an essential phase of the general education program, the specific courses and subjects to be included for instruction the school year in which the various units of work shall be offered, and the question of requiring some industrial arts work for all boys are still the subject of much discussion. The tendency seems to be toward organizing the courses on a four-year basis. In the biennial survey of Industrial Education in the United States, 1928-1930, by the Office of Education, Washington, D.C., the following factors are listed as contributing to this movement:

1. The tendency for pupils in the upper school years to continue in school over a longer period of time. Between 1917 and 1928 the percentage of the total school enrollment included in the third and fourth years of high school practically doubled. For the third year of high school the percentage in 1917 was 1.57 per cent; in 1928 it was 3.05 per cent. For the fourth year the percentage was 1.22 in 1917, and in 1928 it was 2.47.

2. The desire to obtain a diploma from a four-year secondary school.

3. The development and organization of more content material for trade and technical courses. In some courses, auto mechanics, for example, the content material has been greatly expanded by the inclusion of additional units of instruction in shop and laboratory work.

4. The desire to obtain increased State aid. In some instances more State aid is given if trade and technical courses are organized in some kind of high or secondary school.

5. Increasing age for entering employment. Legal regulations and employment conditions in the industries are making it more and more difficult for pupils of normal high school age to obtain work.

6. Higher qualifications for admission to trade and technical schools (28:26).

As technical education in the Chicago High Schools gradually expanded the courses were modified and improved to meet changing conditions. The courses are not designed definitely to train mechanics for the trades. They are not specifically vocational but are of the nature of those of general education. There is a considerable body of workers in modern industry who occupy a position between the wage-worker on the one side and the engineering expert on the other. The technical schools aim to prepare their students to fill these positions. They are usually called the "non-commissioned officers." Professor Mays believes the technical schools are admirably fitted to the task of training such workers:

> Modern industry has within its ranks a large number of draftsmen, inspectors, salesmen, estimators, installation specialists, demonstrators, minor executives, and other specialists all of whom must have a good general education and a considerable amount of technical knowledge. Their work requires familiarity with production processes, a knowledge of technical principles underlying these processes, and a general education about the character and extent of the high-school graduate. The graduates of these schools are given special preparatory work for a brief period in industry before being assigned to the non-commissioned jobs, but their high school training is chiefly relied upon for their preparation (25:95).

The Chicago technical high schools are not, as commonly believed, trade schools. Referring to the technical high schools, the following excerpt from the Biennial Survey of Industrial Education in the United States, 1928- 1930, is enlightening:

> Between two occupational extremes, represented by the engineer and the tradesman, there is a great body of industrial

workers who need training of a character and amount in excess of that necessary for the journeyman tradesman but less than that required for the engineer (28:27).

If we examine the typical course of study in one of the technical high schools of Chicago we can see that this objective is kept in mind. The student is given courses in English, mathematics, science and the social studies of perhaps the same character he would get in an academic high school. In some courses he misses the opportunity to study a foreign language but in its place he is given training in the practical arts, not an intensive training that he would get in a strictly trade school but sufficient training to acquaint him with this type of work. The program of technical education in the Chicago high schools consists of general academic subjects, a "sequence of shop subjects," and required courses in mechanical drawing. The technical courses have many variations such as "technical course - no language," "technical course - language," "architectural course - language," "architectural course - no language." The three technical high schools for boys (Lane, Crane, Tilden) offer language and non-language technical courses, and the Lane and Tilden High Schools offer language and non-language courses in architectural and mechanical drawing.

The four-year technical and architectural curriculum of the Tilden Technical High School is typical of the technical programs of many of the high schools. The curricula of the Tilden Technical High School are presented in the following

tables:

Curricula of the Tilden Technical High School

TABLE VII (35:12)

FOUR*YEAR TECHNICAL COURSE (NO LANGUAGE)

1B	2B	3B	4B
English	English	English	English
Wood Shop	Foundry	Machine Shop	3rd Electric
Mechanical Drawing	Mechanical Drawing	Free Hand Drawing	Mechanical Drawing
Algebra	Geometry	1st Electric	Chemistry
General Science	World History	Physics	United States History
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

1A	2A	3A	4A
English	English	English	4th Electric
Pattern Shop	Forge	Machine Shop	Mechanical Dr.
Mechanical Drawing	Mechanical Drawing	Mechanical Drawing	Chemistry
Algebra	Geometry	2nd Electric	United States History
General Science	World History	Physics	Civics
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

TABLE VIII (35:12-13)

FOUR-YEAR TECHNICAL COURSE (LANGUAGE)

1B	2B	3B	4B
English	English	English	Machine Shop
Wood Shop	Foundry	1st Electric	Mechanical Dr.
Mechanical Drawing	Mechanical Drawing	Free Hand Drawing	Chemistry
Algebra	Geometry	German - French	German - French
General Science	Biology	Physics	United States History

TABLE VII (continued)

1B	2B	3B	4B
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music__	Music	Music	Music

1A	2A	3A	4A
English	English	2nd Electric	English
Pattern Shop	Forge	Machine Shop	Chemistry
Mechanical Drawing	Mechanical Drawing	Mechanical Drawing	United States History
General Science	German - French	German - French	Civics
Algebra	Geometry	Physics	3rd Electric
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

TABLE IX (35:12-13)

FOUR-YEAR ARCHITECTURAL COURSE (NO LANGUAGE)

1B	2B	3B	4B
English	English	English	English
Wood Shop	Architectural Drawing	Architectural Drawing	Free Hand Drawing
Mechanical	Free Hand Drawing	Free Hand Drawing	Chemistry
Algebra	Geometry	Solid Geometry	United States History
General Science	Biology	Physics	1st Electric
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

1A	2A	3A	4A
Engoish	English	English	Chemistry
Forge	Architectural Drawing	Architectural Drawing	United States History
Mechanical	Free Hand Drawing	Free Hand Drawing	Civics
Algebra	Social Studies	Advanced Algebra	2nd Electric

TABLE IX (continued)

1A	2A	3A	4A
General Science	Geometry	Physics	3rd Electric
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

TABLE X (35:12-13)

FOUR-YEAR ARCHITECTURAL COURSE (LANGUAGE)

1B	2B	3B	4B
English	English	Architectural Drawing	English
Wood Shop	Architectural Drawing	Free Hand Drawing	Free Hand Drawing
Mechanical	Free Hand Drawing	Solid Geometry	Chemistry
Algebra	Geometry	Physics	United States History
General Science	Biology	German - French	German - French
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

1A	2A	3A	4A
English	English	English	Free Hand Drawing
Forge	Architectural Drawing	Architectural Drawing	Chemistry
Mechanical Drawing	Free Hand Drawing	Advanced Algebra	United States History
Algebra	Geometry	Physics	Civics
Science	German - French	German - French	1st Electric
Gymnasium	Gymnasium	Gymnasium	Gymnasium
Music	Music	Music	Music

The Strayer Survey of 1932 makes this seemingly valid criticism of the technical courses offered in the Chicago technical high schools :

All the technical courses have been developed around the college preparatory courses planned for the students who expect to enter the engineering college. The students who expect to enter employment upon graduation from high school take the same technical program as those preparing for college, with the exception of a foreign language. No modification of the general academic requirements has been made for the large group of high school students who wish to prepare for technical employment, and who would profit by a more intensive technical program (35:14).

The Flower Technical High School for Girls is the only high school maintaining a four-year technical course for girls. The following table gives the four-year technical curriculum:

TABLE XI (35:15)

FLOWER TECHNICAL HIGH SCHOOL - FOUR-YEAR TECHNICAL COURSE

Year and Subject	Periods per Week	Units of Credit	Year and Subject	Periods per Week	Units of Credit
1B			1A		
English	5	1	English	5	1
Science	5	1	Algebra	5	1
Algebra	55	1	Science	5	1
Food Study	5	½	Textile Study	5	½
Art	5	½	Art	5	½
Music	2		Music	2	
Physical Ed.	3		Physical Ed.	3	
	30	4		30	4
2B			2A		
English	5	1	English	5	1
Geometry or History	5	1	Geometry or History	5	1
Botany	7	1	Botany	7	1
Care of Textile Fabric	5	½	Millinery	5	½
Sewing	5	½	Art	5	½
Physical Ed.	2		Physical Ed.	2	
	29	4		29	4

TABLE XI (continued)

Year and Subject	Periods per Week	Units of Credit	Year and Subject	Periods per Week	Units of Credit
3B			3A		
English	5	1	English	5	1
French-German	5	1	French-German	5	1
Chemistry	7	1	Chemistry	7	1
Cafeteria Management	10	1	Pattern Study	5	½
Music or Weaving	5		Music or Art	5	½
	32	4½		32	4½
4B			4A		
English	5	1	Civics	5	1
French	5	1	French	5	1
United States History	5	1	Uhites States History	5	1
Dietetics	5	½	Child Care	5	½
Art	5	½	Music or Art	5	½
Music or Needle Work	5	½	Garment Construction	5	½
	30	4½		30	4½

The course is general in character and includes four years of English, three years of science, two years of formal high school mathematics, two years of a foreign language, and American history. Ten periods a week are required in such subjects as foods, textiles, art, sewing, millinery, and dietetics. The Flower Technical High School is now located in a new building with increased facilities enabling the school to serve more adequately the thousands of girls desiring the type of training not provided for in the strictly academic school.

The place and function of industrial arts courses in the curriculum of studies of the Chicago high schools demand care-

ful consideration and study. If the curriculum is to be modified changes should come only after a careful study. Those who are responsible for the maintenance of a scientific and up-to-date curriculum must make a critical study of the position available to our young people, set up specific objectives and then modify the industrial arts courses to meet the local situation. Whatever courses are maintained should not be specifically vocational but should be of the nature of a general education.

Industrial arts courses should prepare the individual to live and work in a modern industrial environment. Professor Mays very aptly presents this attitude when he says:

> Whatever the character of the lists of objectives, it is clear that the aims, while having to do with industrial facts, materials, processes, and problems are still not specifically vocational, but are of the nature of those of general education. Industrial arts is not designed definitely to train mechanics for the trades but in so far as it is possible to do so through industrial courses, to produce the insights, skills, habits, and attitudes which should characterize all men living and working in a modern industrial environment (25:201).

CHAPTER VI

THE TEACHING STAFF

When manual training was first introduced into the high school curriculum one of the most difficult problems was the securing of properly trained teachers. Those candidates who did have the trade experience lacked the necessary pedagogical training. In the early years the academic requirements were very rigid and specialists from the trades were unable to meet these requirements. The first records available show the stringent academic requirements. For teachers of manual training in the Chicago high schools in 1901-1902 we find the following:

Teachers of Manual Training

The candidate must be 22 years of age and pass a physical examination. He must file credentials showing

1. Training equivalent to a Normal School.
2. Four years' teaching experience or
3. College graduate - one year of experience.

The Examination (Average 75 per cent)

1. Mathematics
2. Drawing
3. Physical Science (Elements of Physics and Chemistry)
4. Theory and practice
5. Shop technique (Wood-work) (36:248)

As the manual training movement was in its infancy and its worth still doubtful, practical men from the trades were frowned upon as teachers. All teachers were required to hold a general certificate, shop and academic teachers alike. Con-

sulting the records of 1904 we find the academic requirements still in force:

The candidate must present, in advance, credentials showing the following:

A. Graduation from an accredited college and two years' successful teaching in graded schools of good standing or

B. Six years' successful teaching in secondary schools, at least two of which must have been in one and the same school system.

The examination will consist of major and minor papers. Each candidate will be expected to write one major and four minors, and will not be allowed to take both a major and a minor except in the same subject. Psychology and pedagogy will be required of all candidates as a minor.

Manual Training in High Schools

Major

A. Woodworking, including carpentry, cabinet making, pattern-making and wood turning; or

B. Foundry - shop work; or

C. Blacksmithing - shop work

D. Machine Shop - shop work

Minors

1. Theory and practice- principles and methods

2. Drawing - Free Hand and Mechanical

3. English

4. Mathematics (17:4)

The advocates of the traditional academic curriculum were unwilling to change the rigid rules. Skilled tradesmen of course lacked the proper educational qualifications and

teaching experience. Many alert high school principals sensed the weakness of the existing requirements. They argued that the college trained individual lacked the proper trade experience. While possessing the academic requirements, the thorough practical knowledge of the skilled artisan was lacking. Between 1904 and 1910 there began a concerted effort to lessen the academic requirements. A committee of high school principals was appointed to devise a new set of requirements. Some academic training must be included, but not the rigid ruling that college training was essential. The outcome of this committee's work was a compromise. They advocated a new type of certificate called the limited certificate. Teachers in high schools holding a limited certificate were not to receive the same maximum salary as teachers holding the general certificate. Consulting the records, we find the following requirements for this new type of certificate called the Limited Certificate, adopted in 1910:

Teachers in High Schools holding limited certificates shall be placed on a salary schedule with a lower maximum than those for teachers holding general certificates. They must present credentials showing:

A. An education equivalent to that indicated by the public high school course of Chicago, and

B. At least three years of special training.

The examination for limited certificates will consist of a major and three minors; the major paper counting fifty per cent and each minor 16 2^3 per cent in determining the final average, and candidates must attain a general average of seventy-five per cent on their major paper, and in case the

major paper includes both written and practice work they must obtain 80 per cent in the practice test.

Major

A. Woodworking
B. Foundry
C. Blacksmithing
D. Machine shop
E. Electrical Construction

Minors

English
Mathematics
Drawing - Mechanical and Free Hand (18:3)

Upon examining these new requirements we may note that the academic requirement was lowered from that of a college degree to the equivalent of a high school training. No teaching experience was needed, but three years of special training were substituted. With the more liberal academic requirements specialists from the trades could now be secured. After the new type of certificate had been in existence for three years, Mr. Bogan, Chairman of a special committee of high school principals, made the following comment:

It is true that until rather recent times the roads from shop to school in Chicago was blocked by academic requirements, but within the last two years the rules have been changed so that now it is possible to secure practical men and women for teachers without subjecting them to the traditional type of academic examination (12:263).

Having secured men from the trades as shop teachers, the problem was not yet completely settled. Many people still contended that the shop teacher was inadequately prepared to teach. While possessing a thorough knowledge of his trade he

still lacked the proper equipment to teach his subject successfully. Commenting on this, R. M. Smith, Supervisor of Manual Training in the Chicago High Schools, in 1915 advanced the following criticism:

> For Technical High Schools we must have technically trained graduates - men who have taken up science and mathematics as well as the shop work from the industrial point of view, and who are pedagogically fit for the work.
>
> Their general education is too often defective; and they have, of course, no pedagogical training (14:123).

In a modern technical high school we perhaps need men of both types, the college trained technician as well as the skilled artisam from the trades. Commenting on this, Albert G. Bauersfeld, Director of Technical Studies in the Chicago High Schools from 1918 to 1932, and in close touch with the teacher situation says that the college trained teacher may perhaps be better able to present the book knowledge than the skilled tradesman, but where a practical demonstration is required the skilled artisan is superior. The man from the trade does not hesitate to don workmen's clothes and actually demonstrate the work, such as the pouring of hot metals or working at the cupola. The white collar college trained man might hesitate to dirty his hands or soil his clothes.

The supply of teachers for technical work in the Chicago high schools in recent years is usually composed of men from the Manual Training Department in the elementary schools, of graduates of engineering colleges, and journeymen from the

trades. There are many leaders in industrial education who still insist that the shop teacher should be a tradesman. They argue against the character of subjects included in industrial training programs. The protest against the inclusion in the program of studies of such subjects as psychology, history of education, and general methods courses. Great emphasis is placed on the requirement that the shop teacher should come from the trades. In the Biennial Survey of Industrial Education in the United States, 1928 - 1930, we find the following statement:

> Recently there have been pronouncements against the character of subjects included in industrial-training programs. Such subjects as general psychology, history of education, and general methods courses have become a target of those leaders in industrial education who believe in the inclusion in the program of studies only those subjects which have direct and immediate bearing upon the efficiency of instruction in industrial subjects. This does not mean that one who expects to become a teacher of shop subjects should not take any of the above-mentioned subjects, but it does mean that they shall not be counted as specific training for shop teaching. No objection is raised to a shop teacher being a college graduate, but objection is made to a college graduate becoming a shop teacher unless he is a qualified and experienced tradesman with necessary preparation for teaching. The first essential always for a shop teacher is that he be a tradesman. Being that, it is quite possible to give him a short pre-employment training course, followed by in-service training and training during summer vacations that will make him an efficient teacher (28:40-41).

For teachers of technical subjects in the Chicago high schools there are now the following types of certificates:

(1) General Non-Academic (Technical and Special) Certificates.

(2) Limited Non-Academic (Technical and Special) Certificates.

After meeting certain specific requirements teachers holding Limited Certificates may secure General Non-Academic Certificates. Teachers holding Limited Certificates are placed on a salary schedule with a lower maximum than that for teachers holding general certificates. The present salary schedule for both types of certificates is presented here to show this distinction.

Teachers in High Schools
Limited Certificate

Lower Group	First Year	$1800
	Fifth Year	2550
Upper Group	First Year	$2700
	Fifth Year	3300

(Increase $200 per year to fourth year, then $150 per year.)

Teachers are advanced from the lower to the upper group by taking a required number of study courses or by examination. The salary schedule for teachers holding general certificates has a higher maximum.

General Certificates (All Subjects)

Lower Group	First Year	$2000
	Fifth Year	2800
Upper Group	First Year	$3000
	Fifth Year	3800

(Increase $200 per year.) (19:56-57)

The present requirements for the General Non-Academic

Certificate as given by the Board of Examiners is as follows:

1. (a) Graduation from an accredited college and
   (b) Two years' of successful teaching experience, or

2. (a) Graduation from an accredited college and
   (b) Completion of the required work in the Chicago Normal College, and
   (c) One year of successful teaching experience.

All candidates for general certificates will be examined in one major and the minor subjects as indicated below, and must attain a general average of eighty per cent with no subject below fifty per cent; provided that the major subject shall not be the same as any of the minor subjects and shall be counted double the value of any minor paper in the examination.

Majors: To depend upon the announcement for each examination.

Minors: Professional study, English, mathematics, general history and civics, science or any subject which shall be approved by the Board of Examiners (19:12-13).

To secure the general certificate the candidate must have a college degree. While possessing the academic requirements, the teacher holding such a certificate often lacks the valuable trade experience.

The Limited Certificate, however, is more liberal in its academic requirements and enables specialists, practical men from the trades, to become teachers. The requirements for the Limited Certificate are as follows:

A. A diploma of graduation from a four years' high school of the grade of the Chicago public schools and in addition

B. At least five years of special training in the major subject.

The examination for all limited certificates will consist of a major and the specified minors as indicated in this circular; the major counting fifty per cent in determining the final average and candidates must attain a general average of seventy-five per cent, with at least eighty per cent on the major, and in case the major includes both written and practice work they must obtain eighty per cent in the practice test. The majors shall be the same as for the general certificate, but the minors shall be less intensive (19:19-22).

Teachers holding Limited Certificates but not having college degrees may secure General Non-Academic Certificates and thus secure the higher salary providing they pass an examination in three regular minors and meet the following requirements:

Teachers not having college degrees, but holding limited certificates, may take an examination in three regular minors to obtain a general non-academic certificate, provided they shall have taught five years (50 months) in regular day high schools upon the limited certificate and have an efficiency rating of excellent or superior for the last year of service (19:22).

Shop teachers, specialists from the trades, are difficult to secure as teachers. They simply do not have the proper educational qualifications. Many of our shop teachers are elderly men from the trades who are not vitally concerned with methods of teaching. Perhaps the lack of interest in methods of teaching is counterbalanced by their thorough knowledge of their trade. Many of the better teachers have improved their education by vacation courses and have become excellent teachers. The ideal shop teacher perhaps is one who comes from the trades, is alert and open-minded, is willing to devote some time to teaching methods, and the science of education. One

of the chief difficulties is the stubborn notion of the mechanics teacher that he knows what to teach and how to teach. This is perhaps true of the older men who are drawn into the teaching work. Another problem is that of the related-subjects teachers, who have had long experience as instructors in academic subjects, but little or no trade experience. It is difficult for this type of teacher to change his objectives of appreciation and culture to those of utility and vocational application. Since we have both types of teachers in our high schools, the man from the trades and the college graduate, it is all important that there shall be the closest cooperation between them. A mutual understanding of the problems of the other and a conscientious desire for close cooperation will perhaps help in the solution of the problem.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Technical education in the Chicago high schools has had a steady and phenomenal growth from its modest beginning in 1890. During this year the English High and Manual Training School offered a three-year course in manual training and had an enrollment of 259 students. Today nearly all the high schools offer some form of hand training and in addition the three technical high schools for boys offer a four-year technical course. Over 50,000 boys are now taking shop and drawing courses in our high schools. Manual training was first sponsored and encouraged by private enterprise. After proving its worth this work was taken over by the Chicago Board of Education. The English High and Manual Training School opened in September, 1890. This school offered a three-year course, permitting subjects of a practical nature, yet not neglecting the college preparatory courses. Manual training as a phase of general education was gradually expanded and schools offering such work were opened on the North and South sides of the city. The two-year vocational course was established in September, 1910, thus keeping in school many boys who could not remain in for the full four years. Prevocational schools were established in September, 1912, furnishing a new type of training for the indifferent, maladjusted, problem boy of the

seventh and eighth grades. More practical training for girls was provided with the opening of the Lucy Flower Technical High School in September, 1911. The courses have been expanded and enriched. During the early period manual training included such shops as wood-working, forge and foundry. The schools have added, in many instances, such subjects as printing, electricity, sheet-metal work, auto-mechanics, aeronautics, and radio. Technical training is considered as a part of a general education rather than strictly vocational. There is a considerable body of workers in modern industry who occupy a position between the wage-worker on the one side and the engineering expert on the other. Technical schools aim to prepare their students for these positions. They are usually called the "non-commissioned" officers of industry. The program of technical education in the Chicago high schools consists of general academic subjects, a "sequence of shop subjects," and required courses in mechanical drawing. The graduate of a technical course has had nearly all the academic work required for entrance to college and in addition training of a practical nature, enabling him to enter some phase of industry.

When we consider the teaching staff we find that during the early period the academic requirements were very rigid. Specialists from the trades could not meet these requirements. Many school principals saw the need for skilled tradesmen as teachers and argued for less stringent academic requirements.

The adoption of the Limited Certificate in 1910 reduced the academic requirements from that of a college degree to the equivalent of a high school education. This brought into the schools many skilled tradesmen who, in many instances, lacked the proper pedagogical training.

Conclusions

The purpose of this study has been to trace the development of technical education in the Chicago high schools from its earliest beginnings, about 1890, to the present year, 1932. The purpose has been historical rather than critical. The writer has attempted to gather material from all the available sources. After a careful analysis of the material of this study, the following conclusions are presented, some of which may be of value in improving the technical program in the Chicago high schools. Each phase of the problem, however, needs careful attention and consideration.

(1) In so far as the writer has been able to learn, the technical program in our schools is not based on any scientific study as to the available positions. When sufficient pupils enroll for a particular subject, that subject is offered. There is need for an industrial survey to determine the opportunities for training, wages, working conditions, and the number of new workers employed each year in any particular industry. There is danger of training too many young people for a particular industry, who cannot possibly be absorbed. Surveys

should be made periodically to meet changing local conditions.

(2) The technical program in the Chicago high schools has been definitely influenced by the Russian System of hand training, and the Sloyd movement. Industrial arts courses to-day offer a variety of shops in keeping with the present demands of society and industry.

(3) Schools authorities are in common agreement that the purpose of technical education is not to prepare specifically for the trades but to give the pupil a broad, general education.

(4) The technical courses in the high schools give the pupil sufficient technical training to prepare for the "non-commissioned offices" of industry, yet sufficient academic training is provided to permit entrance to college.

(5) The Strayer report of 1932 recommends some modification of the technical courses for those who desire an intensive training for industrial employment.

(6) There is some disagreement as to the place and function of the two-year vocational courses.

(7) One of the most serious problems confronting school authorities is the securing of properly trained teachers having adequate trade experience and sufficient academic and pedagogical training.

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The thesis "The Development of Technical Education in the Chicago High Schools," written by James E. Shine, has been accepted by the Graduate School of Loyola University with reference to form, and by the readers whose names appear below with reference to content. It is, therefore, accepted as a partial fulfilment of the requirements of the degree conferred.

Dr. James A. Fitzgerald — January 26, 1933

Joseph C. Thompson — January 23, 1933