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A study of the relation of industrial arts to school failures

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A STUDY OF THE RELATION OF INDUSTRIAL ARTS TO SCHOOL FAILURES

BY

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THESIS SUBMITTED FOR DEGREE OF MASTER OF SCIENCE

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OUTLINE

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A STUDY OF THE RELATION OF INDUSTRIAL ARTS TO SCHOOL FAILURE
OUTLINE

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INTRODUCTION

This is a study of the relation of industrial arts to school failures. Socio-economic changes have forced public education to assume new burdens in industrial arts education, and school failures likewise have created a serious school failure problem. The data are obtained from facts relating to the present socio-economic conditions, from authorities on the history and development of industrial arts, and also from 138 publications dealing with the causes of school failure. The results indicate, even though actual experimental data on the problem are lacking, that the industrial arts curriculum is entitled to a place of value equal to that of the academic subjects in the general educational program of all secondary schools, and that many school failures are a direct result of the inadequacies of our high school curriculum. It is evident that a large percentage of the students unable to pursue successfully the strictly academic courses, would be better citizens and happier in society if they had chosen industrial arts courses in the high school. The school failure problem is one of great importance because of the harmful effect of sending large numbers of students out into the world with the sense of failure foremost in their minds. For at least some of the failing group industrial arts would be a valuable aid in education.

During the entire history of the public school system, the sifting out or eliminating process at every grade level has been an important function of the public school. Because of the

changed socio-economic conditions the need of a reevaluation of our secondary school program has been forced upon us. The change has caused many educators to question the merits of the elimination process in education, many holding that it is bad psychology to stamp children as failures early in life because of their inability to make adjustments to school conditions. In the past no great concern was felt over the number of school failures, because an alternative was always open to the student. If he disliked school, and was of the age that made school attendance no longer obligatory, he could go out and find some kind of gainful employment, and enjoy the satisfaction of doing what he wanted to do and experience some degree of success.

Today, as never before, all educators are conscious of the serious school failure problem. A pupil may be considered a school failure according to several different standards. For instance, a child who makes passing, or even excellent grades in all subjects, but who is sent into the world a physical, moral, or social weakling, is designated a school failure. Furthermore, a child who passes all his subjects without working up to his capacity, that is, receiving C where he could easily have earned an A, is called by some a school failure. School failure, as referred to in this study, however, is not concerned with these meanings; rather non-acceptable work in a grade or course in consequence of which it must be repeated, or the inability of the public school to hold the students when the alternative

means idleness on street corners, is the meaning here implied. The cause of the failure may be with the pupil, the teacher, the parents, the type of organization, or the kind of administration under which the child has pursued his work. It is failure, however, on the part of someone which necessitates the repetition of the course or grade.

Unemployment

Unemployment has robbed the child of the only possible escape from compulsory school attendance, and has brought on our present serious problem of increasing numbers of failures in school. In the present unemployment situation, when a pupil's leaving school means idleness which is sure to lead to delinquency, one may safely say that failure to retain pupils in school is the major item of importance in the school-failure problem.

In this industrial age the need for workers is apparently growing less and less, and this necessarily makes it increasingly difficult for youth to engage in gainful and productive occupation. Figures gathered at the United States office of Education¹ indicate that there are in this country between ten and twelve million youths unemployed. The Citizen's Conservation Camps have taken a large percentage of those between eighteen and twenty-five years of age, and provided work and wholesome recreation, as well as financial aid to their dependents at home. But what of the youths of high school age?

Secondary Schools No Longer Selective

This study does not aim to discuss the moot question of complete democracy in secondary education. To quote Terman, "Differentiation of courses and enlargement of opportunities for vocational training of the humbler sort is a necessary corollary of the truly democratic ideal."² There is involved the double inquiry, should we have and could we have it? If we should, can we afford it? Figures gathered showing the cost of delinquency in children's institutions³ and also the alarming increase in court costs dealing with young criminals, prove that we cannot afford to let failing students remain out of school and out of work. New appraisals of the obligations of society, and the more economical way of dealing with its members will show that universal education is the only known way to guarantee the success of popular government.

Today we are faced with new problems, and the school's most serious one is what to do with the "new fifty percent" entering our secondary institutions. Many in this group are in school only because of compulsory attendance, while others are there because of inability to secure employment. A choice between school and work would undoubtedly show an overwhelming majority in favor of work of some kind. Many reasons are advanced as to why this large group apparently shows no interest or desire to continue in school.

The advances which have been made in the psychology of learning in general and of childhood in particular fall into

line with the increased importance of industry in life, for modern psychology emphasizes the radical importance of primitive unlearned instincts of exploring, experimentation, and "trying on."⁴ One must understand the mental characteristics of children, how they think, and why they think as they do, before they can be classified and helped in their life work. That there are dull children may be taken for granted. We need no expert advice to tell us that there are differences in the thinking qualities and abilities of children. Classifying accurately the really dull and the bored or disinterested may require some assistance and is certain to call for close observation. To quote Terman, "It is not uncommon for one third of students to drop out of high school without completing the work of the first year. Not all of this elimination is traceable to inferior mental ability, but that a large part is due to this cause, there is no longer room for doubt."⁵

School Failure and Resultant Loss to Society

In 1917 the United States Commissioner of Education P. P. Claxton⁶ gave his opinion, based on the records of his office, that every year one million boys and girls fourteen and fifteen years of age leave school to go to work. After an exhaustive study of the schools of this country, Ayers⁷ stated that it is safe to count on ten percent of the children leaving school on reaching the age of thirteen, forty percent by the time they are fourteen, fifty percent of the remainder at fifteen, and again fifty percent of the remainder at the age of sixteen.

Some concern was felt over the elimination from school in such alarming proportions, but many leaders in education believe that for the many who find school life distasteful, greater educational benefits may be derived from gainful employment.

The fact that the schools fail to hold pupils is as old as public education itself. Investigations made concerning this phase of education, reveal the fact that literally multitudes of children are hopelessly retarded. One of the first influences that turn the thoughts of boys and girls toward the outside world and away from the school is the discouragement that follows lack of progress, the tragedy of "getting behind", the bugaboo of "failing to pass". So the great army of the "eliminated" is constantly recruited from the ranks of the discouraged, uninterested, retarded and defective children in the school.

Today the situation is far more serious not only because of the increased numbers of children of high school age, which according to birth rate statistics have reached the high point, but also because society offers no alternative. Society cannot afford to let its youth remain idle, because of a dislike for school, during the habit-forming years of life. The slogan today might quite aptly be "School or deterioration of youth".

The schools are becoming conscious as never before of the existence of that large group of boys and girls who heretofore have been dropping out of school at the earliest opportunity,

either to enter employment, or merely to escape a routine which is distasteful and repugnant from their point of view. Educators recognize that the enforced return to school of these students will be worse than futile unless some different type of program can be provided; and they are asking what types of practical activity will meet the situation, especially for the average groups.

Educators have not emphasized the positive relationship between pupil interest and pupil success. If a pupil desires to succeed, he will put forth greater efforts and his accomplishments will be greater than if he is indifferent. Many psychologists⁸ agree that motivation is almost essential for the slower mental group, and pupil activity in concrete form makes difficult work more readily understood. It may be that many of the failures in our present academic high school see the futility of striving for something that seems of little use in their future life. Many are uninterested because they are unable to appreciate the value of life in the future. The material things in life about them are meaningful, and they are anxious to get out into the world where they feel they will be able to realize some degree of success.

Industrial Arts Today⁹ shows clearly the tendencies and reflects the demand for this type of education in the public schools. How broad the industrial arts curriculum should be, and what academic subjects other than English and mathematics should be included in a high school course, seems farther than

ever from solution, and is probably not even desirable from the standpoint of individual differences. The point stressed in this study is that industrial arts subjects should be offered in the curriculum of all schools, so that at least students unable to pursue the strictly academic studies might pursue some form of educational work.

The value of industrial arts in solving the "school-failure" problem is best understood if approached from the angle of individual differences in mental ability, life interests, special aptitudes, and many other personal qualities. One can readily see that a purely academic education is not feasible for all the children of all the people. The accomplishments of men in industry are the best arguments on the value of industrial arts.

Definition of Industrial Arts

To quote Bonser, "Industrial arts are those occupations by which changes are made in the forms of materials to increase their values for human usage. As a subject for educative purposes industrial arts is a study of the changes made by man in the forms of materials to increase their values, and of the problems of life related to these changes."¹⁰

To quote Bonser again, "Industrial arts include any manipulative process that use the methods of industry adapted to abilities of school children."¹⁰

To quote Norton and Norton, "Industrial arts is coming to be a study of human achievement, of man's progress in

taking raw materials and making them more useful in satisfying needs for food, clothing, shelter, records, utensils, tools and machines."¹¹

II SOURCES OF DATA

SOURCES OF DATA

The data for this thesis were obtained from the following sources:

1. History of industrial arts
2. Publications on school failures
3. Interviews with educators in the New England States
4. Communications from 42 states regarding industrial arts as a factor in reducing school failures
5. Theses from the Agricultural and Mechanical College of Texas on value of industrial arts courses
6. Pamphlets from the United States Department of Commerce regarding fundamental changes in occupations
7. Publications on industrial arts in the general educational program
8. Literature of a general educational nature bearing in a general way on portions of the study
9. Data on school failures in Providence and Hartford

In attempting to get a clear perspective of the exact status of industrial arts in the general educational program of our public schools, it is essential to know its history. The history mirrors the work through many changes, even before its acceptance as a subject in the public school curriculum. Early forms of the work that were taught in the home and other outside agencies are today the responsibility of public education.

The major part of the investigation deals directly with school failures and recommendations advanced for solving this problem. Of the 138 publications on school failures outlined

and tabulated on the chart, more than 100 were published since 1928. Because the socio-economic conditions existing previous to 1922 would have relatively less bearing on the present day problems, none of the articles written before that date were included in the study. In so far as it was possible, only publications dealing directly with failures in the secondary schools were charted, (because of the fact that the problem is primarily a high school one). All of the articles were outlined, special attention being given to the authors' reasons for failures. The reasons given were differently worded and phrased, and the meanings were uncertain in many cases. The twenty-seven headings listed on the chart were selected on the basis of the number of times the specific items were mentioned by the authors, and also on the theory that some of the reasons, although seldom mentioned, could not in any way be considered to fall under those more frequently enumerated.

For example, some authors listed as sub-headings causes that others gave as general headings and vice versa. Some authorities merely stated the lack of a broad high school curriculum as a cause of failure, making no specific mention of what subjects to include under the broader program of education. Others gave the lack of substitute courses as a cause of failure, but did not mention what subjects to include under the substitute courses. The lack of a flexible program and the lack of an activity program were also mentioned frequently, but none of the subjects included under these programs

were given. Other writers gave "industrial arts" as a factor in reducing school failures, as well as a means of providing a more flexible course and an activity program.

In addition to the study of publications on failures, contacts were made with every State Department of Education in an attempt to find out what progress, if any, was being made toward solving the problem. Consultations were held with educators in the New England states regarding school failures and the industrial arts program in their schools.

Communications sent to the State Departments of Education in forty-two states brought returns from thirty-one educators. Because of the fact that in the majority of states no state department of industrial arts exists, it was necessary to send out many additional communications. These letters were sent to superintendents and industrial arts supervisors in the large cities seeking information in reference to the failing students in their schools.

The study brought information regarding investigations made on industrial arts education in the Agricultural and Mechanical College of Texas. The investigations compiled as theses contributed valuable data regarding industrial arts in general education.

Present day trends and tendencies regarding industrial arts subjects in the public schools were obtained from the Philadelphia schools and an article by a superintendent of schools in Faribault, Minnesota.

Pamphlets on unemployment, issued by the Bureau of Labor Statistics and discussing fundamental changes affecting all kinds of gainful occupations, were helpful in the study.

Publications on the value of industrial arts in a general educational program make an important contribution to the problem. These articles are by superintendents of public schools, professors of industrial arts education, directors of industrial arts in large city schools, and high officials in industry.

Valuable literature of a general educational nature, but pertinent to the many phases of the study (educational philosophy, changes in education, history of education, psychology, teaching processes and methods, and intelligence of school children) was used as reference material for statements made and to justify conclusions on different phases of the study.

Studies made on school failures in Providence and also in Hartford were included in the study. The Hartford study was made in connection with the school survey in 1937, and in Providence the study was made during the term 1933-34 in an attempt to classify "drop-outs" from the senior high schools.

III HISTORY OF INDUSTRIAL ARTS

HISTORY OF INDUSTRIAL ARTS

As far back as 2000 B. C. the Jews definitely recognized the social value of handwork. In every country from early history until changing conditions made this no longer possible it was considered the duty of every father to teach his son a trade.¹² The importance of apprenticeship training was at all times recognized by statesmen and rulers. The rules of the Benedictines (1450) insisted upon manual labor, and they also required reading as a daily occupation of the monks. Outside of the monasteries also, participation in skilled labor was the principal means of education, though not of the kind of education which was recognized as such by the schools.¹³

The invention and the early development of the art of printing (1423-1480), the Protestant Reformation with its center in Germany, beginning early in the sixteenth century, unfolded new educational possibilities and put new life into teaching methods. During this period there appeared two of the fundamental ideas upon which modern instruction in the industrial arts has been built. The first of these is that sense impressions are the basis of thought and, consequently, of knowledge. The second is the related idea of "learning by doing".¹⁴

Handwork as Part of School Work

John Locke¹⁵ became the chief exponent of the idea that education should fit a boy for practical life, whether it be in a trade or a profession. He advocated learning the manual trades (a) because they afford good physical exercise; (b) the

skill gained is worth having -- it may be useful; (c) they provide trades, diversions, or recreations. Locke had visions of manual work as a means of improving methods of education and of giving it a more scientific and practical content.

The man who first organized handwork as a part of general school work and who enunciated certain principles of handwork instruction was Pestalozzi (1745-1827).¹⁶ He is known as the "Father of Manual Training". This new idea in educational handwork in the schools, rising in Europe in about 1800, was championed by Froebel and Herbart, and it was thought to be of great social and economic benefit to society.

Of all the educational experiments of the early 19th century, the one instituted by Fellenberg (1771-1884) at Holwyl, Switzerland, had the greatest influence on manual arts. This was due in a large measure to the sound physical organization of the institution. Fellenberg believed in class distinctions, and hoped to establish good relations between the upper and lower classes through handwork; his plan was followed in Switzerland, Germany, and the United States.¹⁷

Russian System and Scandinavian Sloyd

The Russian system¹⁸ undertook to give scientific tool instruction by a series of exercises that involved the fundamental tool processes. Della Vos believed it necessary to analyze the tools, processes, crafts, trades and materials into their elements, and to arrange these elements into a methodical course of instruction. The construction of a

specific number of joints and experience in a definite number of tool processes were prerequisite to any attempt at even starting a piece of cabinet work. If we add to the basic things just mentioned, the boy himself, his physical and mental condition, we have sufficient basis for both the method and the content of American manual training.

The theory of the Russian work was expressed in its slogan "Instruction before Construction".¹⁹ This is almost the antithesis of the best thought in America now. The slogan in the schools in the United States might fittingly be "Construction accompanied by instruction".

The second country to make handwork a part of the educational system was Sweden (1858). Sloyd at first received the attention of the Swedish government not as a means of education but as a means of furnishing the leisure hours in the rural communities with interesting occupation. This was known as Home Sloyd. In 1872, special schools were established for the exclusive purpose of teaching Sloyd in Sweden. The schools at Naas developed into the Sloyd Seminarium in 1884, and under the inspiration of Otto Salomon (leader of work in Sweden), this teacher training school became the dominating force in the Swedish Sloyd work, and had a great deal to do with the establishment and practice of manual work in other countries.

Salomon²⁰ emphasized the cultural function of Sloyd. Perhaps his greatest service was his adaptation of instruction

and training in handwork to the conditions imposed by school organization. He graded the work and adapted it to the successive stages in the development of the pupil without giving to it the bleak formality which made the exercises of the Russian system so unattractive. Only objects of value for their usefulness or their beauty were prescribed.

Three European countries, Finland, Sweden and Russia, were the first to recognize manual training as an educational instrument. The first to propose such courses as a part of school instruction was Finland. In 1858, the Emperor of Russia appointed Uno Cygnaeus to reorganize the primary schools of Finland, which he did along Froebelian lines.²¹ He proposed courses in manual training, including woodwork, metalwork, pottery, etc. In 1866, manual training was made compulsory in some form in rural communities. It was not compulsory in the city, but was required to be taught in the teacher training schools for men.

The German and French Influence

There is apparently very little in French educational handwork which influenced that in the United States. As early as the close of the 18th century, shops were established in schools. The general characteristics of French manual arts were very similar to those of the Russian system. One development is especially interesting. Fischet in 1842 established shopwork in a school for the purpose of giving boys an idea of what they were best fitted to do. It was exploratory in nature.

The educational handwork developed in Germany had little influence on manual arts in general education in America. The instruction given was usually of highly technical or trade character. The construction schools of Germany, particularly Munich, were models in the scope of trade education offered. A very large percentage of the population received this type of education. One contribution, however, was a recognition of the need that the teachers be trained both in pedagogy and their particular trade or craft.²²

Influences Affecting the First Teaching of Handwork

The first idea of teaching industrial arts (handwork) in America was during the Colonial times, when pioneer schools for the orphans and the extremely poor children were offered courses in Farm and Trade Schools in the city of Boston by private philanthropic organizations. Nearly a dozen trades and occupations were taught in these institutions.

Industrial Schools (Juvenile offenders)

Following shortly after these industrial schools for orphans and other poor children, came the early industrial reformatories for juvenile offenders.

Arts and Crafts Movement

The Arts and Crafts movement originated in England by Ruskin and Morris found friends in the United States, and its influence was felt in woodwork offered as hand instruction. It arose as a protest against the ugliness and bad taste which characterized construction during the last half of the 19th century.²³ The Arts and Crafts movement made the manual training teachers conscious of the fact that there were such things as good taste, artistic ideals, beauty in simplicity,

originality in design, and honest construction, even if it did not help them immediately to achieve such results.

Technical Schools

Another movement of collegiate grade, which also concerned itself with educational handwork, was the development of numerous scientific, polytechnic and engineering schools between 1824 and 1865. These schools were organized principally in the East. The Morrill Land Grant by Congress in 1862 brought about continued development of engineering colleges in connection with Mid-Western and Western State Universities.

The Beginning of American Industrial Arts

The first that was heard of teaching handwork in America as a part of the regular secondary school curriculum was in St. Louis. A plan had been slowly developing since 1857 for handwork instruction in secondary preparatory schools associated with the Washington University. These experiments culminated in 1879 in the organization of the St. Louis Manual Training School of Washington University.²⁴

In 1873, before the founding of the manual training school, Dr. Woodward of Washington University advocated the instruction of handwork as part of boys' education, regardless of their educational aims. On this ground he has been considered the real father of manual training. It has been pointed out that it was only under the cloak of formal discipline that educational handwork could have secured a place in our education at that time.

Included also in the curriculum of the manual training school were drawing, science, mathematics, and languages. To this extent the course was broadening. Woodward's idea of manual training was as a cultural subject. He planned that through manual training students would be imbued with the dignity of labor, would get an insight into social and economic problems, and would be guided vocationally by their shop experience. The tremendous expansion of American industry with the consequent breakdown of apprenticeship and the labor shortage made it necessary to provide engineers and workers.

In 1876, Della Vos,²⁵ who devised exercises for tool instruction in wood and iron, exhibited his system of mechanic arts instruction at the Philadelphia Exposition. There were men there with receptive minds, for in America as well as in Russia had been felt the want of a scientific method of teaching the mechanic arts in the technological schools. Professor John D. Runkle, President of the Massachusetts Institute of Technology, saw and studied the Russian exhibits. In 1877, Dr. Runkle established a Mechanic Arts School of Boston, connected with Massachusetts Institute of Technology. Shop courses were an important part of the curriculum. Before the system had become generally accepted, however, another influence appeared which modified the ideas behind the Russian system.

In 1882, the Sloyd system gained a foothold in the schools of Boston. Immediately after, that city became a

great experimental center for educational handwork in America.

Leavitt of Boston, trained in the Russian system, early saw the interest value to be derived from the adoption of useful articles. At first he incorporated useful articles after the exercise pieces were completed. Later, as supervisor in Boston, he accepted the principle of the useful articles entirely. He also taught drawing in connection with the woodwork. Larsson, another early teacher and experimenter in Boston, first used the Swedish models in his work. He found that to be useful in America, the models had to be redesigned. This he did. He also added mechanical drawing and found in the wood lathe a valuable adjunct. Coping saw work and whittling were frequently a part of the early American Sloyd.²⁶

Sloyd Training School (Boston)

In 1888, the Sloyd Training School was established in Boston under the patronage of Mrs. Quincy Shaw, who continued to support the institution up to the time of her death. The director was Larsson, a former student under Salomon at Naas, and the leading champion of the Sloyd system in America. The Sloyd Training School is now a part of the Boston Teachers' College.²⁷

It is both amusing and interesting to contemplate some of the odd combinations that developed in the attempt to graft the mongrel Russo-Swedish ideals and practices upon spontaneous and democratic America. "Plain American Johnny Johnson had in one brief decade gone through the double metamorphosis from Yonny Yonson to Yonsky Yonsovitch."²⁸

It is evident that the Russian influence contributed the ideals of trade skill, analysis and organization of subject matter, teaching methods and the making and using of mechanical drawings. The Sloyd influence from Scandinavia contributed the following: useful articles, better pedagogical methods for drill instruction, new conceptions of the aims of handwork in terms of cultural values, and recognition of children's instincts and desire for activity.²⁹

Chicago, Toledo, and Baltimore Organized Manual Training Schools

In 1884, three other cities, Chicago, Toledo, and Baltimore, organized manual training schools on the order of the St. Louis institution. In the first two, private corporations furnished the funds with which to build the schools, but to Baltimore goes the credit of having established the first manual training school as an integral part of the public school system. After 1886 public manual training schools grew very rapidly in number, in size, and in influence. A few attempts were made by private individuals and institutions to carry manual training into the elementary grades. Up until 1882 only Montclair, New Jersey, had attempted to make manual training a part of the elementary system.

Mrs. Quincy Shaw furnished the fund for an experiment in carpentry with elementary boys in the Dwight School, Boston, Massachusetts. This city gave the work some recognition and transferred it to the English High School building in 1884, but it was four years later when it was finally decided to make

manual training work a part of the program of studies. The same year (1888) New York made its start in manual training. A manual training school was established in 1886, in Springfield, Massachusetts, to which pupils might elect to come from the elementary schools for manual training.

After 1888, manual training made its way steadily into the elementary schools in every section of the country.³⁰ At about the same time, Leland of Philadelphia was constructing a system of hand training closely correlative with art and nature study. It was based upon the conviction that the representation of natural objects and creation of articles of beauty in wood, brass, leather, and other materials were the kinds of handwork best adapted to the strength, the tests, and abilities of the child, and possessing at the same time the highest cultural value. The ideas characteristic of this movement and the Sloyd movement have become incorporated extensively in educational practice.³¹

This movement by Leland was influenced by the work of Morris and his followers, bringing to our schools the thought for beauty in handwork suggested through the arts and crafts movement in England.

Change in Conception of Industrial Arts

Suggestions and attempts to industrialize and vocationalize shopwork began somewhat before 1900. The movement began with a new conviction, that shop courses should bear a more intimate and definite relation to the industrial world.³² The feeling became rather pronounced that the school shopwork

should provide a fund of information and experience relating to materials, processes, methods of manufacture, opportunities for employment and success, of certain fundamental industries.

Thus, the term Industrial Arts supplemented Manual Training. It was contended that even the work of the elementary school shop should offer some measure of guidance toward future occupation, that it should be in a sense prevocational.

This conception met with considerable encouragement because it was in line with the modern movement toward reality and social content in education.³³ It offered the means of providing for pupil participation in, or at least first hand observation of, certain phases of the real work of the world. It held out the hope of breaking away from the fundamental abstractions both of text books and of cut-and-dried shopwork. The fact remains that all shop courses in the schools of today have been thoroughly industrialized.

Manual or constructive activities will often be based upon fundamental industrial experiences essential to the life and welfare of the individual and of society in general. The legitimate end of knowing is doing. Right thought to remain healthy must ultimately issue in right deed. This is an unalterable law of moral hygiene; and anything which can be accomplished in the schools to establish the necessary physical co-ordination in brain, which will open the lines of least resistance between the centers of thought and the centers which execute thought, will make powerfully for the prevention of the utter divorcement of thought and morals which we find in such

characters as Rousseau, and which is expressed so forcibly by the Roman poet when he exclaims:³⁴

I know the better, and approve it, too

Condemn the worse, and still the worse pursue.

The extent to which industrial arts may be considered a part of the present secondary school curriculum is explained by Frederick J. Moffitt, Superintendent of Schools;³⁵ Arthur B. Mays, Professor of industrial education;³⁶ and John Woodman Higgins, President of the Worcester Pressed Steel Company.³⁷

To quote Frederick J. Moffitt, "The school executive has pondered over the rapid increase. The classes in Latin and algebra have attempted to absorb hundreds of newcomers with indifferent success. The school executive has not yet been convinced that he can spend money on new equipment and build up expensive new courses such as industrial arts."

To quote Arthur B. Mays, "Industrial arts has been thought of as a frill condoned by an overgenerous board of education or an ambitious school executive. Something to keep youngsters out of mischief, in the same way that teachers used to pass out building blocks to the little folks to quiet their protesting squirms against an intolerable school routine."

To quote John Woodman Higgins, "Since industry is now (1937) the dominant factor of every life, from the cradle to the grave, the three R's fade out as a fundamental objective and take their proper place as techniques or tools. The school program in Ohio starts with childhood's first im-

pressions and contacts--food, clothing, light, play, home, nature and later the materials, machines, and processes of industry. Of course, these researches very soon require the techniques of reading, writing, and arithmetic, and in time as a pupil has need, Latin, Greek, and calculus, as necessary tools for his development.

Educational expediency as well as economic necessity now demands the immediate expansion of our public trade and technical schools to meet the call for educated, all-round skilled craftsmen who can create and maintain our new complex, mechanized, mass-production.

Less than one percent of the \$3,000,000,000 expended annually by the taxpayers of the United States on public education is spent on industrial courses. Ninety-nine percent is devoted to training for other professions, many of them overcrowded and likely to remain so for years. With no other program functioning adequately to meet a 80,000 annual net shortage of skilled craftsmen, manufacturers will have to lower their standards, curtail output, and train operators from uneducated incompetents, until the schools rise and meet this need."

At best it may be said that industrial arts is in its early stages of development, with the larger cities in a dilemma as to its exact status in the regular high schools, and with little of the work being carried on in any of the rural high schools.

A few of the larger cities, notably Los Angeles, Philadelphia, and Providence, have a rather complete industrial arts program in the junior high schools, and a growing program in the senior high schools.

The amount of credit allowed for industrial arts subjects varies, some schools giving no credit for the work and others allowing only one-half credit. The present tendency is toward allowing full credit for the work in industrial arts in all high schools offering it in the curricula.

The brief and condensed chart of the history of industrial arts on the following page is illuminating for those people who cannot see or understand the distinction between industrial vocation or trade education, and industrial arts education. It mirrors early history when no distinction existed between the two subjects, down to the present time when there is complete separation of the two kinds of education.

About the time of the World War legislation was started in many states holding industry liable for injuries or deaths of persons on their property. This together with increased efficiency forced industry to hang up the "no admittance" sign. The "no admittance" sign prevented youth from roaming at large through industry, and deprived him of a valuable incidental education (his only insight into industry).

As civilization advances, the gap between the capacities of the young and the concerns of adults widens. Learning by direct sharing in the pursuits of grown-ups becomes increasingly difficult except in the case of the less advanced occupations. Much of what adults do is so remote in space and in meaning that playful imitation is less and less adequate to reproduce the spirit. Ability to share effectively in adult activities depends upon a prior training given with this end in view. Intentional agencies -- schools -- and explicit materials -- studies -- are devised. The task of teaching certain things is delegated to a special group of persons.³⁸

Industrial arts provides prevocational education for those desiring to enter industrial vocations, but primarily general education for all boys. This provides a broad general educational base upon which all boys may select their particular vocation.

Summary of History of Industrial Arts

The history of industrial arts mirrors important changes that have taken place in civilization. Industrial arts through its many stages of development, has indicated by its nomenclature a broadening of its field of activity and a trend toward making it an integral part of the whole educational program, rather than specific job training.

In early history the matter of providing the material needs of each home concerned every member of the family. It was the duty of every father to instruct his son regarding the task of providing food, shelter, and clothing for the family.

As time passed organized education replaced the home methods of teaching. Guilds and trade organizations undertook the problem of supplying industry with skilled labor. Although industry was removed from the home and gradually concentrated at larger and more distant points, the obstacle of distance was overcome by youth's natural curiosity. Youth in its wanderings visited industry and stopped only when confronted with a locked door and window.

The machine age gradually revolutionized the methods of production, and, due to increased efficiency, all industrial plants today display the "no admittance" sign. The taking away of this outside unorganized agency of education means that youth will be deprived of all first-hand knowledge of industry, unless the school assumes this important work in education.

Besides taking away from youth the opportunity to roam at will and observe industry at work, the complexity of industry

also prevents youth from understanding the manufacture and production of the material things he sees and uses every day of his life.

The further mechanization of industry and the further improvements in technological methods, will widen the gap between industry and youth, and at the same time force him into a world where the machine must be used even in the daily routine of life.

The steadily increasing postponement of the beginning age for entering employment is shown by the phenomenal increase in students attending high schools, and the secondary school curriculum must offer a wide variety of courses to meet the needs of this immense student body. Present day conditions make it advisable for a student to postpone as long as possible a decision as to his life career. Students must be urged to think in terms of occupational fields, rather than in terms of specific jobs within a field.

Early specialization becomes no longer desirable, because the economic picture changes very rapidly, with old vocations passing out and new vocations coming in. Students must be advised to make the broadest possible preparation so that adjustments which are certain to come, may be made with as little disturbance as possible.

One's total range of abilities and interests should be explored. The earlier these special interests and abilities are discovered and given encouragement, the better. All latent powers should be brought out and the individual should

be encouraged to develop versatility, so that he will not be one-sided, with narrowly specialized skills.

The following are important criteria for evaluating industrial arts education:

1. It provides for the type of education that youth has been deprived of because of the "no admittance sign" in industry.³⁹

2. It provides for a new kind of education that increased use of machines has made necessary.^{39A}

3. It provides children with the opportunity of physical activities which bring their natural impulses into play, going to school is a joy, management is less of a burden, and learning is easier.⁴⁰

4. It provides motivation for the academic subjects.

5. It provides for the elementary skills in the use of the more common tools and machines in modifying and handling materials, and an understanding of some of the more common construction problems.^{40A}

6. It provides for exploration in industrial pursuits, for avocational interests, and for intelligent consumption.^{40B}

7. It provides for wise choice of occupations. Good choice comes from experience in doing tasks similar to those in callings under consideration, knowledge of the characteristics of these callings, and study of the relationship of one's abilities and interests to the needs of occupational life.^{40C}

IV PROCEDURE IN GATHERING DATA

PROCEDURE IN GATHERING DATA

The first step in the procedure of gathering data for the thesis was to find out what had been written on this problem. All publications on the school failure problem were sought, and libraries at Yale University, Clark University, and both the city and state libraries in Hartford were used as sources for procuring bibliographies of books on the subject.

Previous to the year 1922 the publications on school failures did not take into consideration the socio-economic conditions of the country, so these were not used in the study. It was during the years 1922 - 1928 that the writers first recognized the changing world conditions as having direct bearing on public school education. These publications, together with the ones following the year 1928, except those dealing entirely with primary and elementary school failures were charted.

The State Board of Education Library at Hartford furnished the greatest number of publications, and also assisted by borrowing others from the United States Office of Education.

Consultations were held seeking the opinion of educators in the New England States regarding school failures and the relation of industrial arts to this perplexing problem.

Letters were sent personally to every State Department of Education attempting to obtain the opinion of leaders in education regarding the school failure problem, and of the relation of industrial arts to this problem.

V DISCUSSION OF DATA

DISCUSSION OF DATA

School Failures

The history of industrial arts gives a sound basis for the conclusion that it is of great value as an educational subject, and one that should be included in the curricula of all general high schools. The next step is to find out what educators say about the alarming number of failures in our schools. All publications which were examined in regard to the subject of school failures were charted and outlined, and all conclusions point to the fact that industrial arts would assist in solving the failure problem in nearly all cases. Failures due to the following causes point to industrial arts as the best possible solution:

1. Defects in administration
2. Deficiency in mentality
3. Lack of interest
4. Difficulties in academic subjects
5. Difficulties in behavior
6. Dislike for school
7. Lack of effort
8. Laziness
9. Discouragement

The chart (school failures) shows that twice as many publications list defects in administration as a cause of failure as compared to any other cause. The next highest number lists low mentality as the cause of failure. Low mentality has always been considered the major cause of school failure by most people.

Defects in Administration

Defects in administration were listed by ninety-eight writers as a contributing cause of failure, and many writers

emphasized almost exclusively the narrowness of the school curriculum. J. J. Metz,⁴¹ in his article, ignored the causes of failure, and wrote on the educational value of industrial arts. The following are some of the defects in administration:

1. Failure to provide a broad curriculum
2. Lack of homogeneous grouping
3. Lack of industrial arts and home making courses
4. Improper grading of school work
5. Lack of special classes
6. Classes too large
7. No substitute courses for failing students
8. Failure to work students to maximum of their ability
9. Failure to change teacher when large groups are failing
10. Defects in course of study
11. Defects in text-books
12. Class not sectioned according to ability
13. Lack of flexible curriculum
14. No consideration of individual differences
15. Failure to provide motivation
16. No project teaching
17. Lack of pupil activity programs
18. Lack of coaching teachers
19. Lack of rational promotional standards
20. Lack of flexible promotional standards
21. Failure to provide proper training
22. Failure to provide study classes in school
23. No bond between teacher and pupil
24. Failure to make case studies of failing pupils
25. Need of experiencing success
26. Failure to correct variations in promotion standards
27. Teachers allowed to fail large numbers without explanation
28. Lack of uniformity of minimum requirements

Of the 138 publications tabulated, 98 gave defects in administration as the cause of failure, and apparently our philosophy of education has been lagging and has failed to keep pace with the times. The high schools obviously have failed to provide a broad enough curriculum for the wide variations of individual differences that research and tests in psychology have proven are essential for the full realization of every

child's innate abilities. Many refer to the inadequacies of the present traditional type of education with every indication that it falls short of meeting the present day requirements.

The chart on defects in administration lists the causes of failure which the writers considered under this heading. It was difficult to make any classification of sub-topic, because of the great variety of terms used and the vagueness of descriptions regarding what to include under the sub-topics. In the list of twelve causes of failures due to the short-comings of the curriculum, it is obvious that industrial arts would be the solution of at least five of them, because of the fact that any expansion of the curriculum would generally include subjects that the non-academic minds could master. It is quite evident, as shown by chart (Failures Due to Defects in Administration) that industrial arts may well be a factor in the solution of the following causes of failure:

Lack of:

1. Proper course
2. Flexible curriculum
3. Experiencing success
4. Project teaching

To quote Terman, "Instead of a single curriculum for all, merely divided into eight successive levels, it would be better to arrange parallel courses of study for children of different grades of ability. Some such solution seems necessary if we are to adjust school work to the abilities of the children and at the same time avoid the admittedly serious evils of repetition."⁴²

To again quote Mort, "The best treatment that can be

given pupils of low ability is the development of individual programs which will give them as much opportunity, other than the ordinary curriculum, as possible in school."⁴³

To quote Mort again, "Improper guidance in selection of curriculum, will lead to failure, unhappiness, and discouragement rather than to the success and encouragement which should come from school work."⁴⁴

It is probable that case studies would should that this group should be enrolled in a class of industrial arts.⁴⁵ This homogeneous group would be better understood by the teacher, which would result in a better bond between teacher and pupil. There are only two items listed under defects in administration to which industrial arts could not make a direct contribution. They are as follows:

1. Providing adequate school study
2. Correcting variations in promotion standards

The two following contradictory causes of failures found many supporters. The debatable question lacks sufficient data proving the merits of the principle in any test cases.

1. Lack of a definite standard for promotion
2. Need of flexible program for promotion

Glessner lays the blame for failures on lack of a definite standard for promotion. He cites figures showing more boys failing than girls, although I. Q's. of both are about the same. Comparisons are also made of teachers' marks showing the variations and inconsistencies in the marking systems.⁴⁶

Douglass lays the blame for failures on lack of a flexible program for promotion. He cites the lack of proper guidance as

the cause of failures. He says pupils should be enrolled in courses insuring success.⁴⁷ Dresden says, "Place a child in a course in which he is most likely to succeed even though it requires changing the course."⁴⁸

This brings out the fact that either one is desirable only if it reduces failure. Peter's⁴⁹ bibliography publication referred to the desirability of a uniform system for promotion, rather than leaving it to the teacher's judgment. Gerling⁵⁰ emphasized the need of modifying the school curriculum to allow for varied and individual differences.

Low Mentality

Fifty-three of the authorities gave low mentality as one of the causes or as a contributing cause of failure, but they were not in agreement as to what extent it was responsible for failure. Maddocks⁵¹ said, "Contrary to general belief, low mentality is not the cause of any large percentage of failure". Walls,⁵² in a study made in a small school system (Kent, Ohio), finds that only fifty percent of failures can be assigned to low intelligence. Green,⁵³ in a study of chronic failures in the high school of Danvers, reports that low intelligence should mean less difficult subjects, with a tendency toward vocational.

The reports emphasized the fact that more girls than boys are graduating from high school, and yet the I. Q.'s. of both girls and boys are equal. Facts also prove that more boys are failing. Other facts show that after failing, far more girls than boys remain in school and graduate. Data also show that

regardless of sex, many with low I. Q.'s. graduate from high schools, and that many with average I. Q.'s. drop out of school. All writers seemed to be in agreement, even those who did not attribute failure to low intelligence, that the failing group include many students of average intelligence.

The teachers' judgment rather than an intelligence test was the basis for classifying many students in the low mentality group according to some authorities.⁵⁴ Under these circumstances one can understand how difficult it would be to separate the bored and uninterested from those of low mentality.

The following are some of the reasons for placing failing students in the group of low mentality:

1. Low I. Q. rating
2. Mental incapacity
3. Standard of work low
4. Lack of academic ability
5. Slow
6. Unwise previous promotion
7. Lack of attention
8. Carelessness
9. Lack of application
10. Unable to concentrate
11. Lack of coordination
12. Lack of background
13. Social maladjustment
14. Guesses in school work
15. Inability to adjust to school conditions
16. Undesirable attitudes
17. Failure to do required work

To quote Holmes, "So far we have differentiated between two great classes of mentally retarded children. Before us lies the immediate task of further sub-classifying the two classes. For the incurably retarded this is not difficult, but not so for the curably backward. They furnish chiefly a pedagogical problem and as yet not enough has been done to bring out clear

and well-accepted separations of varieties into groups."⁵⁵

To quote Mort, "There is a growing discontent with requiring the dull pupil to spend his entire life on work planned for the first six years of school life of the normal pupil. They (pupils) should have opportunities in the last years of school to study community civics, to learn about vocations, and perhaps take specific training that will better fit them to earn a livelihood. At sixteen they may discontinue school with a diploma showing a major in some vocational subject, or at eighteen may graduate from high school with a specialized diploma that indicates the type of work carried on successfully."⁵⁶

According to many of the publications, the traditional type of high school course did not provide an opportunity for realizing to the maximum degree the varied abilities of all the children. The mechanically-minded child has little or no opportunity to follow activities for which he is best suited, because academic subjects fail to provide an outlet for the special abilities of the individual. Some writers mentioned the value of the industrial arts as a motivation for academic subject matter.

Lack of Interest

Only 42 writers said "lack of interest was a factor in school failures." But this number attributed great significance to the interest factor in education. Some authorities gave lack of interest as the sole cause of an excessive number of failures, and others recommended changing the entire curricula

core to provide interest in extreme cases. Every subject cannot make itself interesting enough or useful enough to appeal to every type of mind, and therefore the schools should adapt their curriculum to meet the individual needs of the pupils.

Of the number that gave lack of interest as a factor in failing in school work, more than one-half made recommendations for a broader school curriculum, providing for the interests of the mechanically-minded student.

Kulp⁵⁷ says that the interest factor always insures success.

To quote Kilpatrick, "Whenever you find any one, except, apparently, an ascetic, doing a disagreeable thing, it is because there is beyond the disagreeable thing some interest that pulls him. He cares so much for this interest that he is willing in its behalf even to undergo the disagreeable matter intervening."⁵⁸

In the study made of the limited data gathered, it appears that with a definite aim and purpose (remote interest) greatest academic success results. But in spite of the importance of a definite aim, or interest, a great many are enrolled in courses both in our high schools and our colleges simply because they want credits to graduate.

The following are the reasons given by the authorities for failure due to as they put it to lack of interest in school subjects:

1. Lack of effort
2. Failure to hand in work
3. Lack of home study
4. Little studying in general
5. Idleness
6. Inability to concentrate

7. Irregularity of attendance
8. Carelessness
9. Inattention
10. Lost or mislaid books
11. Cheating
12. Over emphasis of athletics
13. Shows, parties and dances
14. Dates
15. Faulty preparation of lessons
16. Poor attitude
17. Lack of purpose
18. Squandering of time
19. Inadequacy of preparation

Finally, as soon as the law permits, the uninterested and discouraged group leaves school. The schools provide opportunities for the academically-minded student, but little--or in some schools--nothing for the mechanically-minded student.

Lack of Interest

Twenty authors gave "lack of effort" as a contributing cause of failures, but were not in accord as to why the students lacked effort. Some linked lack of effort with lack of interest; others linked it with lack of self-confidence and lack of ability. The two major causes of failures were given by Feingold⁵⁹ as lack of ability and lack of effort.

Academic Difficulties

Academic difficulties were mentioned by twenty writers as a reason for failure. Briggs⁶⁰ in a study made by his committee, gave this as a big factor--furnishing the third largest group of failures. It appears that the authorities were considering large school systems when they referred to academic problems, because the great majorities of schools must be considered as having an academic curriculum.

Test cases showed that boys with an interest toward concrete activities (industrial arts) had excessive fear in the academic subjects. In regard to the offerings of our high schools, the rural districts have no opportunity for education equal to that afforded the city student. Children in the rural districts must enroll in classical courses, and the mechanically-minded child is doomed to failure. Reorganization of the high schools and units of administration is essential.

Behavior Difficulties

Behavior difficulties were mentioned by fifteen writers as a contributing cause of failure in school. In many cases behavior problems were dealt with by suspending students from school or in some cases by giving them a cipher for school work; this meant students were being penalized and failed wholly for misconduct without any recognition of their ability in school subjects. Most authorities agree that failing students in a subject is the poorest method of correcting disciplinary troubles, and more often leads to permanent problem cases.

Dislike for School

A number of arguments were advanced supporting the contention that dislike for school was a cause of failure, and many held that it left no other alternative. Only twelve writers mentioned dislike for school as a factor in failure. Apparently other writers felt very little could be done to correct this feeling and attitude towards the school, and that with this

group better results could be obtained only when the compulsory school period was over. No one could hope to obtain good results if the bored feeling prevails, the only remedy being to find ways of changing this attitude.

Laziness

Laziness was given as a cause of failure by fifteen writers, and it is obvious that it would be a positive factor in contributing to failure. One author held the point of view that everyone is lazy in things he dislikes, and that laziness would be greatly reduced if we could interest every child in some activity. It is surprising to note the large percentage of failures that teachers attribute partly to the laziness of pupils.

Discouragement

Discouragement was pictured as being a big factor in failure by twenty of the writers, and much of the responsibility for this attitude was blamed on the schools. Test cases showed inferiority feelings and attitudes of mind were responsible for nine out of thirty-one failures. From a questionnaire on failures, the second largest group said discouragement was the cause of failure.

It is an obvious fact, that in every school system throughout the country the retarded student is a discouraged individual and tends to leave school earlier than other children. Douglass⁶¹ in a study of "drop-outs" from schools finds that these students are a discouraged group and rarely receive an encouraging mark

or word of praise during their school life. This discouraged group is in need of a special teacher with inspiration, one to help it to do its work. Discouragement will cause one to take on an inferiority complex and give up or only half try in all future work. There seemed to be no consistency between "discouragement" and I. Q. ratings. Giving a failing mark when pupils are doing their best, means forcing them to give up in despair. Industrial arts courses would treat these discouraged students as individuals and provide them with the type of education that their abilities and aptitudes warrant.

To quote Terman, "High schools at present are in a measure 'class' schools. The child of 75 to 85 I. Q. has an inalienable right to the kind of training from which he can derive profit. Since there are so many who cannot master the usual high-school studies, new lines of work of a more practical nature will have to be added."⁶² It would turn this group from liabilities to assets in any community.

Although industrial arts cannot be considered the major means of correcting the faults under the following causes of failure, yet industrial arts is a valuable aid in helping to improve the conditions in these situations:

1. Poor teacher
2. Non-attendance
3. Poor guidance
4. Maladjustment
5. Too much athletics
6. After school attractions
7. Causes unknown

Poor Teacher

Adams⁶³ in his article "Why Teachers Say They Fail Pupils",

gives many answers to the problem of student failure. Data collected from teachers on various percentages of failures show that two-thirds of failures is the sole responsibility of teachers, and 56 percent gave low teaching standards as a reason for pupil failure. Almost no objective evidence was offered to show that the proficiency of the pupils was low, or that the standard was reasonable. The opinion of the teacher was the sole criterion in promotion. Evidence was found to show that teachers still use fear of failure as inducement for better work.

Good teaching is the most potent preventive of failure, according to McGinnis.⁶⁴ The matter of disturbances caused by pupils, either in preventing others from studying or causing valuable time to be lost during a class period, was placed squarely against the ability of the teacher. Borgeson,⁶⁵ says, "Fundamentally this particular indictment places the blame on the faults or shortcomings of the teacher." The inference being that capable teachers would have little trouble along disciplinary lines.

The fact that authorities placed failure due to fear of teacher as a blemish on the record of an efficient teacher is without question a modern educational view-point. In the past to have children afraid of their teacher seemed to be a mark of distinction and credit, because then it would be an easy matter to secure perfect discipline all during school hours. Apparently the present idea of judging an efficient teacher places less emphasis on perfect discipline, at least if other

more desirable traits must be sacrificed.

Present writers placed the blame of failure to understand any part of school work because of timidity, at the door-step of the teacher. Better teacher-pupil relationship is now considered an asset in any school system and will result in greater good.

Douglass⁶⁶ criticizes the bad effect of present-day school work, because of the tyrannical classroom procedure, on mental hygiene and the development of personality.

School Non-Attendance

School absence was considered a contributing cause of failure by a score of authors, and it is obvious enough that prolonged absence from school results in loss of school work. One author, Clem disagrees on the attendance issue, holding irregular attendance to be responsible for only a small percentage of failure.⁶⁷ The author cited the honor rolls of the high schools as being made up of pupils with many absences checked against them.

If the children fail, due to truancy, the schools cannot be in any way held responsible, unless one considers it the school's duty to make the subjects so interesting to every child that he will want to attend school if physically able. McGinnis⁶³ says, "Good teaching would prevent truancy." Industrial arts serves as the nearest competitor to outside attractions for boys disliking the routine of classroom work. .

Poor Guidance

Poor guidance as a factor responsible for failures received the attention of twenty-two authorities. All writers were in agreement regarding the varying degree of mental abilities and aptitudes of individuals, and they stressed the point that success was possible only if the individual selected work within the limits set by his capacity. Guidance should aid the student in selecting subjects in which it will be possible for him to succeed to the maximum of his inherent talents and abilities.

Maladjustment

Maladjustment was mentioned by fourteen of the writers as being responsible for a minor proportion of school failures. It is evident that the unadjusted school child is a problem child and requires more than average attention if he is to realize any degree of success in school work.

Too Much Athletics

Too much athletics received the attention of only three of the publications. It is evident that a great many boys go to school simply because of athletics (football, basketball, baseball, etc.), and are devoting the major part of their time to these sports. This fact is thoroughly appreciated by all school authorities, and measures are taken to prevent undue time being given to the sports. Most schools make provisions allowing only those students who are passing in all their subjects to continue to play on any of the teams. To strike

the happy medium between athletics and the regular school work necessarily means taking into consideration the individual and giving proper guidance.

After-school Attractions

After-school attractions were checked by five authorities as being responsible to some extent for pupils failing. Any attractions that in any way prevented or interfered with the successful completion of school work would come under this heading. The schools are meeting keener competition every day from outside attractions, and the issue will have to be settled on grounds of greatest good to be derived. The schools can do a great deal to enlist the interest of the child, but because of the immaturity of the child it cannot be left entirely under their control. The cooperation of the home is essential in combating this problem.

Unknown Causes

Twelve writers gave "unknown causes" as the reason for failure in school. The necessity of a more thorough study on the matter of "school failures" was stressed by these twelve authors. Knowing each individual pupil, his characteristics, problems, interests, and motives, is considered by most authorities as a prerequisite to good teaching. It is apparent that the schools of the future will place new emphasis on human personality.

Home Conditions

Home conditions were given by thirty-six authorities as playing a predominating part in causing pupils to fail. To a great extent failure because of home conditions ties up with many other causes, and it is indirectly connected to all of them. It is the school's duty to inaugurate learning conditions that will endure and grow outside of the school, but with the influence of the home so great, failure to establish a bond of cooperation between school and home means that the school is partially failing as a factor in education. The family life is the most potent force for good or evil in every individual's life, and unfavorably conditions existing at home will in most cases be reflected in every phase of the child's life and act as a handicap in producing good school work.⁶⁸

Large Classes

The obviousness of the fact that large classes result in a greater proportion of failures, was the reason that only fifteen publications gave any attention to the problem.

Emotional Difficulties

Emotional difficulties which received the attention of twelve writers have been clarified by a more enlightened study of individual differences. Psychology of learning is playing a more important part in the education of children today, and teachers are realizing more than ever that a better understanding of the individual is a prerequisite to all good teaching.

The emotional side of the individual is a powerful force that cannot be ignored, and proper inspiration will be reflected in a better spirit which will in turn be conducive to success.

Immaturity of Pupils

Immaturity was not stressed as being responsible for any great number of failures, but it received some attention in twelve of the articles. It is apparent that maturity would be a more important factor with every advancing year in school, and that both physical and intellectual maturity are factors in education that will demand greater attention as the enrollment of our high schools continues to increase. Limiting the outlets and opportunities for education to the confines of the classrooms necessarily means a restricted and immature point-of-view in every phase of school work.

Foreign Parentage

Foreign parentage was mentioned by only twelve writers as being a factor in failure. In every case foreign parentage was given as one of about a dozen contributing causes of failure and doubtless was not a sole factor in any one case. It is evident that the language and customs of foreign parents would prevent the school's receiving the desired cooperation necessary in realizing the greatest benefits, but foreign parentage in itself was not considered a major cause for failure; on the contrary, the eagerness of the parents to help, although unable, might be an added incentive for harder work by the pupil; thereby overcoming the language handicap. Quoting

Mort,⁶⁹ "Foreign parents could not help them in the English language, because they did not know the English names of many of the common things about them." The greatest harm would result if the children became ashamed of their parents because of parents inability to participate in school affairs.

Poor Foundation

Poor foundation was given as a cause of failure by a half-dozen of the authorities. Somewhere in previous years of schooling pupils failed to master the required essentials, thus making satisfactory progress impossible. Others given by authors are:

1. Lack of previous educational opportunities
2. Lack of use of English speech
3. Bad home conditions
4. Faulty study habits

Change of School

Only five writers named change of school as a factor in the pupil's failing, and one of these authors gave figures showing that in two groups checked, those in the same school system, and those who changed school, the greater percentage of failures occurred in the group that changed schools.

Cigarette Addicts

Three writers attributed failure to the fact that pupils were cigarette addicts. The fact that only three writers mentioned it, proves that it is the exception rather than the rule.

Summary of School Failures

It is obvious that none of the headings listing causes of failure are clear-cut, but on the contrary there is much overlapping. The chart of school failures illustrates that many authorities agree that low intelligence is not the only factor in failure.

The following are examples:

1. Lack of interest
2. Academic difficulties
3. Behavior difficulties
4. Dislike for school
5. Lack of effort
6. Laziness
7. Discouragement

It cannot be denied, low intelligence is a factor in school failures, and apparently the authorities listing low intelligence under defects in administration, hold to the philosophy that low intelligence should mean offering a curriculum adjusted to the abilities of these students.

In listing the causes of failure given under defects in administration, it is obvious that the authorities were at odds on the following items:

1. Flexible curriculum to meet individual differences
2. Definite standard for promotion
3. Special classes for low mentality groups
4. Homogeneous grouping for more efficient class work

The matter of flexible curriculum and a definite standard for promotion was discussed on page 36. The benefits of special classes need little elaboration since groups unable to meet the minimum requirements of regular class work may derive little education from school work except through such groupings. There

was much disagreement regarding homogeneous grouping for students of normal intelligence, and those in favor of such groupings believe it necessary for the accomplishment of the maximum benefits in class work.

It is possible that some or all the causes listed after "proper course", although not mentioned in the publications, might be sub-headings under it. In other words what the writers meant to include under proper course is questionable. The fact that twenty-seven authorities gave industrial arts as a factor, shows that this is the only single cause of failure on which any appreciable number are in agreement.

The causes of school failure given in the outline, together with their tabulation in two chart forms, gives a conglomerate picture of what educators think of the problem. In the opinion of ninety-eight out of one hundred thirty-eight writers, the school administration is to blame for most failures. This is consistent with the report of the Connecticut State Board of Education.⁷⁰ It is important to know that in twenty-three cases the writers reached their conclusions by a study, a questionnaire, or a survey. The study indicated that a more flexible program and one in which the students are interested is essential, but more study is necessary before reaching any solution of the problem. Superintendent of Schools, Campbell, of Boston, makes a statement that nine out of ten students who fail in college are from the ranks of those who have been sent to college by parents or relatives. The analogy may be drawn that in the

case of the large percentage of students being forced to attend school, failures will result unless the curriculum meets their needs.

The study shows that fully one-third of the writers of publications covered in the study gave industrial arts as the preferred correction of the school failures due to defects in administration. Chart on page 56 (Failure Due to Defects in Administration) shows the detail distribution on this point. Others used such terms as "activity program" or "a broader curriculum". By easy inference these terms include industrial arts although they are more extensive than the subjects of industrial arts alone.

The above summary seems rational in view of the data. For the sake of the failing group, industrial arts could well be made the nucleus around which all their school program could be built. Such an opportunity for activity placed in reach of these students for whom success in regular academic work is impossible, would bring new meaning to school life and go a long way toward eliminating failures through vitalizing school work.

Interviews with educators:

In my interviews with educators on industrial arts and school failure problems, the consensus of opinion was that industrial arts would make an important contribution in reducing failures, but that it would not raise the caliber of the students. They felt that the interest factor was a powerful incentive for correct habits and that in as much as industrial arts was more fascinating to the boys it should be utilized as an educational subject.

It was the consensus of opinion that many boys leaving school might remain in school if they found something of interest in school subjects. The large percentage of children not academically minded but of average intelligence has brought a problem to the schools in which industrial arts may help in the solution. No experiments had actually been made and no data are available on the problem.

In summing up, it might be said that educators believed that the high schools were no longer college preparatory, and the curriculum needed to be changed to provide a kind of education for all children. This will ultimately lead to a happier and better adjusted citizenry.

Inquiries of State Educational Administrators

Communications to forty-two states inquiring as to the part that industrial arts is playing in solving the school failure problem brought returns from thirty-one.

Table

Number of Communications Received	
Superintendents	15
Professors in State Colleges	8
Supervisors of Industrial Arts	13
Teachers of Industrial Arts	<u>20</u>
Total	56

All of the states answering reported industrial arts as being in many different stages of development, and every educator gave as his opinion that industrial arts was an important factor in keeping boys in school.

No data were available in any state proving that industrial arts was a factor in reducing school failure, but Superintendent of Schools, H. H. Kirk,⁷¹ Faribault, Minnesota gave data as follows:

Faribault High School

Comparison of figures on the growth of high school and growth of city

High School Enrolment	:	City Population
1912	:	1912
200	:	24,000
1915	:	1915
400	:	25,000
1925	:	1925
960	:	25,000

At the time of expansion in industrial arts other courses also expanded Faribault High School.

The superintendent of schools reports that while the population of Faribault increased slightly during years 1887 to 1912, the enrolment of the high school remained about the same, due to the limited offerings (strictly classical courses). Starting in 1912 with the introduction of industrial arts courses, the enrolment in the high school more than doubled, and yet the population of Faribault remained practically the same. At about this time other courses were introduced into the high school (scientific and commercial). The superintendent claims that industrial arts is one of the factors responsible for the increase in high school enrolment.

Charles F. Bauder,⁷² shows the increased demand for industrial arts in the Philadelphia schools. This city carries on two types of industrial arts programs in its regular senior high schools, one being technical school preparatory, and the other leading to graduation without the ordinary privileges for entering higher schools of learning. He gave data to prove his point as follows:

Philadelphia, Pennsylvania

Philadelphia High Schools

Comparison of figures on the growth of the industrial arts department and the growth of entire school.

Industrial Arts Department	:	Entire School	
Enrolment	:	Enrolment	
1930	4,788 students	1930	15,229 students
1934	8,493 students	1934	22,302 students
Percentage increase 77.4	:	Percentage increase 46.4	

Theses on Value of Industrial Arts Courses

The following studies help to prove that industrial arts courses should be offered on the same basis as other subjects in the high school.

Stockton⁷³ in his study of the integration of drawing with mathematics and science in the Waxachachie High School during the year of 1932-33, finds that the integration of drawing with mathematics and science enables students to make higher grades in the various phases of mathematics and science. Two groups were studied to show integration of the subjects. The first group was made up of students not taking drawing, and the second group, students taking drawing along with their other subjects. In every case the average of the drawing group was higher in the correlated subjects than the average of the non-drawing group.

A second study was made to determine which of the two subjects--mechanical drawing or general shop work--was better preparation for college engineering. It was found that mechanical drawing students made an average higher than the shop-work students.

Four separate studies were made covering the work of students who had and had not taken industrial arts courses in the high school. It was found that students who had taken industrial arts courses made higher averages for the course in the engineering college than those students who had not taken the industrial art courses.

Nowotny⁷⁴ in his study of High School Industrial Arts

Courses as Training for College Engineering Work, finds that industrial arts courses in high school are valuable for fitting students for college engineering work. It was found that those students who had taken industrial arts courses in high school made higher average grades than those who had not taken industrial arts courses, although they may have entered with lower rating scores.

Pinson⁷⁵ draws the following conclusions from his study of the scholastic achievement made by pupils in the language and industrial arts courses in the high school of Texas: in English, mathematics, and science, the language course pupils are superior to the industrial arts pupils, but in industrial arts the language pupils are inferior to the industrial arts course pupils.

The language course pupils are the boys who took the regular required high school subjects with language as their elective. The industrial arts course pupils are the boys who took the regular high school subjects with industrial arts as their elective.

The conclusion of this study indicates that these industrial arts course students were superior in their own field to the language course students. The practical experience in industrial arts course gave them an advantage over the language course students in dealing with industrial arts.

Likewise the language course students were superior to the industrial arts course students in their own field.

Fundamental Changes in Occupations

Alba M. Edwards⁷⁶ discusses the important changes taking place among manual workers. With machines replacing sheer man power to a greater extent each year, the problem arises as to what can be done with the people being replaced by machines. It obviously means unemployment for these people or educating them to assume jobs of a semi-skilled nature. It would seem that educating these people at public expense to qualify for semi-skilled work would be vastly more economical than to allow them to remain unemployed. The problem seems to be to elevate the common laborer to the semi-skilled position, and likewise to elevate the semi-skilled worker to the skilled trade.

The increased demand for semi-skilled workers indicates that the future manual workers will be concentrated largely in the great middle class of semi-skilled workers, due to the inroads of the machine and standardization of products. It is apparent that the great army of the unskilled is by far the largest socio-economic group in the country, and the group from which the semi-skilled workers must be recruited, if we are to avert retrogression.

The prediction is made that the unskilled group will be displaced by the machine, and that there will be a concentration of all workers in a large middle class, comprising the clerical group, the skilled group, and the semi-skilled group. Industrial arts would be valuable as pre-vocational training for the skilled group, and also valuable as a concrete or tangible form of education for the semi-skilled group.

"Occupational Changes Since 1850"⁷⁷ shown by census reports makes one realize the tremendous importance of industry in changing and regulating our mode of living. Years ago communities were self-sufficient to a large extent, but with the growth of the complex modern ways of living, need has arisen for wide and accessible markets and for ease of transportation, both for goods and passengers. The need of developing skill and ability in more than one line of work is growing more important each year because of the continual shifts of industry due to the introduction of more machinery.

Literature on General Education

Literature (not on school failures) on general education was drawn on as a reference to substantiate statements or conclusions arrived at on the different phases of the study. The literature deals with philosophy of education, individual differences, psychology, and intelligence of school children.

In the study, publications on industrial arts education were used as references to substantiate statements or conclusions arrived at during stages of the study. These publications were invaluable in approving the merits of industrial arts in a general educational program.

All of the publications on school failure were written by authorities in the field of general education (superintendents of schools, officials in administrative positions, and professors in teacher colleges.) The writings appeared in the Department of Superintendence 9th year book, National Education Association, American Education Digest, State Teacher College magazines, and

other recognized College publications. The findings (in general) parallel the writings of Terman, Kilpatrick and Dewey, who were quoted many times in the study. Mort, a recognized authority on school curriculum (engaged in survey of Hartford schools) was also quoted in the study.

Copy

Hartford Survey on School Failures

Chart 8

Failing Students -- Hartford High School - 10th Grade

Hartford High School years (1934-35) (1935-36)

I. Q's.

60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	Rating
0	2	3	3	12	14	25	30	32	28	26	20	13	6	1	Students

The table shows the approximate intelligence quotient of 215 students who failed in subjects in Hartford High School.

The median is given as 99.

The statement is made that about one-half of the failing students have an average I. Q.

Intelligence tests were given to all students in the junior high schools by the Hartford Board of Education.

These I.Q's. were used in studying failures in the first year of the senior high school (10th grade).

Copy
 Providence Report

Table XII.

Central High School Drop-outs by Grades and I.Q's.

Grades	Number of Cases	<u>I.Q's.</u>												
		+A	-	+ B	-	+ C	-	+ D	-	+ E	-			
9A*	226	2		20		14	61	40		58		24	7	
10B	144	3		16	1	21	45	16		30		9	3	
10A	140			1	29	1	16	40	26	23	1	1	2	
11-12	181	10	1	18	1	25	43	27		29		1	5	1
Totals	671	15	1	1	83	3	76	189	109	140	1	2	40	11
		(16)		(87)		(374)		(141)		(53)				
Per Cent. of Total	(100.)	2.4		13.0		55.7		21.0		7.9				

*Scheduled to enter Central High School from Junior High School but did not appear.

Source of Data: Permanent Record Cards. Number of cases shown above, 671; number of cases with I.Q. unknown, 67; number of cases with no permanent record cards, 399; total 1137 cases.

VI SUMMARY

SUMMARY

The socio-economic conditions of the country have brought new problems to secondary education. The inability of large numbers of students to pursue the traditional type of education has created a serious problem, because no alternative is now open to them. The continual expansion of industrial arts through all history proves its educational and social value. Present day conditions made the inclusion of industrial arts in a general public school curriculum desirable.

The study shows that all educators consulted are aware of the alarming increase in school failures.

The opinion of educators on the school failure problem is an indication of the need of the expansion of industrial arts subjects in our secondary school curricula, so that all students (including many of low intelligence) may realize some degree of success in school work.

Theses on industrial arts subjects prove that all students are not equally fitted for all types of higher education, and that society has need for many kinds of specialists.

The necessity for even the most humble worker to adapt himself to accelerated changes is important in our present industrial age. Technocracy has brought changes with increasing rapidity, and it is desirable that youth become familiar with, and remain in contact with our industrial world.

The reports on the findings on "failing students" in the senior high school in Hartford (page 65) and also on "drop-outs" from senior high schools in Providence (page 66) agree in

substance with that of Terman. All school failures are not due to low intelligence.

The value of industrial arts is explained in the words of Kilpatrick,⁷⁸ "The older life gave children enough first hand contacts with things to supply them not only with the personal and homekeeping skills but also with the varied meanings of practical affairs necessary to practical thinking. Now unless the schools take special pains, many city children would grow up mentally starved so far as concrete things and their meaning go, not to mention the lack of useful skills."

Quoting Kilpatrick again,⁷⁹ "What the others won't care for, the schools must undertake."

Quoting Terman,⁸⁰ "A large proportion of children must leave school with little direct preparation for life, simply because they are intellectually incapable of mastering the contents of a curriculum which the school has set as theoretically desirable for all."

Present day conditions (unemployment) have made the school failure problem a serious one, and our socio-economic conditions have likewise forced the school to assume new burdens (knowledge of industry originally performed in the home, later by the small industrial shop, and today behind the closed doors of industry).

Even in the case of the low-mentality group, the study indicated the need and value of an "industrial arts centered" school or curriculum.

VII CONCLUSION

CONCLUSION

The study shows that experimental data are entirely lacking and that the problem is not clear-cut. All data gathered on the problem shows that school failures are of great concern to educators, and that for both the normal intelligence and low intelligence groups, industrial arts promises much toward eliminating many of the failures.

VIII SUGGESTIONS

SUGGESTIONS

It is evident that America is at the threshold of a new conception of public school education, -- that of providing the best possible growth for all of its children. The large number of students of normal intelligence, who are either dropping out of school or failing in school subjects, proves that for this group the secondary school offers no challenge. Although experimental data are entirely lacking, all indications point toward industrial arts as the needed vitalizing factor in school work. Industrial arts must also assume its share in providing education for the large group of students of low mentality. This can be done by making industrial arts the nucleus around which the academic curriculum is built, thereby providing the necessary motivation for effective learning for this group of students.

It is evident that industrial arts will assume its rightful place in the educational curricula of all public schools, when educators and the general public are aware of the changed socio-economic conditions, and fully appreciate what public education must offer to provide growth for every individual.

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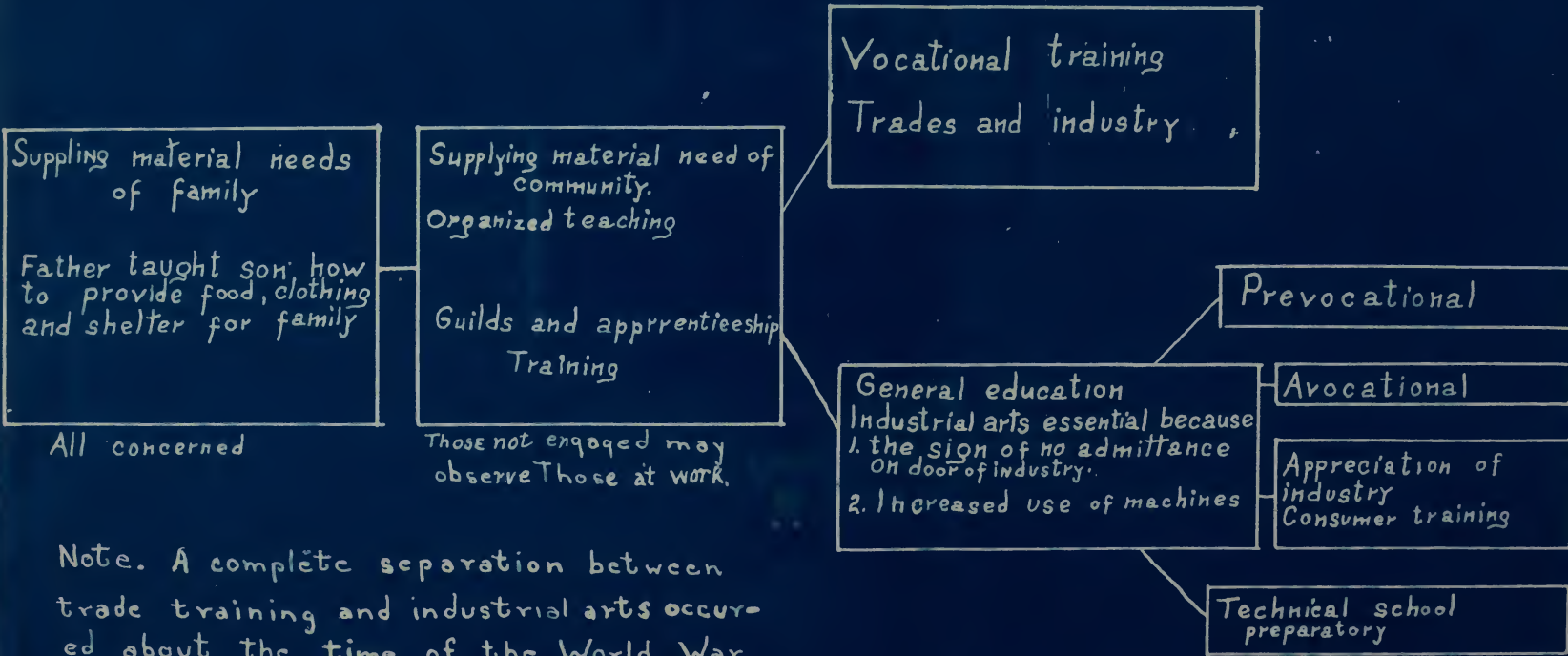
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Approved By:

Graduate Committee

Date _____

HISTORY OF INDUSTRIAL ARTS



Note. A complete separation between trade training and industrial arts occurred about the time of the World War. The introduction of the trade schools & "NO-ADMITTANCE" sign on the door of industrial plants brought about a complete separation of the two subjects.

Approved by

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