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Industrial Arts Objectives

David R. Winegarden

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INDUSTRIAL ARTS OBJECTIVES

By

DAVID R. WINEGARDEN

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree

Master of Science

XII. ORIGINAL OBJECTIVES OF MANUAL TRAINING

XIII. ORGANIZATION OF MANUFACTURING

XIV. PRODUCTION OF MANUFACTURING

XV. PRODUCTION OF MANUFACTURING

XVI. PRODUCTION OF MANUFACTURING

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COLLEGE OF EDUCATION

BUTLER UNIVERSITY

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CHAPTER I

INTRODUCTION

Several incorrect concepts have caused the Industrial Arts work to fail to function to its fullest extent. One idea is that of regarding the school shop only as a producer of "things;" if students produce good "things" they are successful. The individual as a learner is hardly taken into consideration; the project on which he works and the skillfulness with which he manipulates tools and materials are only seen. Another point of view, equally incorrect, is that of seeing the average shop only as a developer of carpenters, machinists, electricians, and draftsmen -- each student, with a bit more training, a potential skilled mechanic. General knowledge and understanding, a wide range of experiences together with their attendant benefits leading to appreciation, are overlooked. Part of the blame for this misunderstanding and other incorrect concepts may be found in the study of the manner in which the subject has developed in our school system. The work has gone through so many stages that perhaps in its present state some of the original desirable objectives have disappeared.
Purpose of the Study

Many Industrial Arts teachers consider their department as a special phase of education, set aside from the rest of the school work. They fail to see their work as a vital part of the whole of education. The growth of the individual as a whole is the shop teachers responsibility as much as that of other teachers in the system. Overemphasis on wrong objectives in their work will weaken the efforts to secure the broad aims of Industrial Arts.

Emphasis on skill, standard attainments, or on the vocational aspect of the work can easily deprive the individual of educational benefits that are desirable and are the right of all.

Perry¹ in discussing this point says:

To many administrators and teachers the Industrial Arts work as a part of general education is too often overlooked, -- it is seen only as an appendage. It should be a definite part of the whole educational structure.

There is a difference of opinion among educators on this statement. The controversy is between those who agree with the statement that it should be a part of the whole educational system and those who feel that the major aim of the original founders who sponsored this work was to train

pupils for a vocation. There are also some who criticize the work, stating that studies show that the course does not fit the boy or girl to make a living.

What is being done today in our academic fields to enliven and vitalize the work is called the progressive, project, or activity method. Basically, it is the effort to utilize the immediate interests of the child or to create interests as the starting point of any learning activity, and then with this interest as a guide, to select some activity by means of which desirable educational experiences may be gained through purposeful activity.

Although this sounds like a very recent concept of education, it was upon such a foundation as this that much of the early support for manual training was placed. The department by its very nature is perfectly fitted to carry out this progressive thought in education.

The purpose of this study is to show that the original founders of manual training always defended it upon its progressive educational value, and it was because of the acceptance of this idea by educators that the new form of educational activity was so speedily and generally accepted.

If this study can show that the foundation of the work was built not upon objectives that emphasized vocational values, but where it rightfully belongs, -- on general edu-
cational values, we will then have a starting point for a united philosophy in Industrial Arts work. If the emphasis is on the individual growth development, through broad rather than restricted experiences, the work then can be truly called progressive.

The Problem

In attempting to formulate a history of Industrial Arts the problem in this study is to show that the original and present day aims set forth in behalf of manual training are based, not on economic reasons, such as specific trade instruction, but on broad general educational objectives.

Value of Study

The chief value of the findings of this study will not rest solely in the production of a history of the Industrial Arts movement. Rather, it is hoped that the study will bring to light the general educational soundness of this type of work which will serve as an aid in the formulation of a future acceptable and desirable understanding of the basic value of Industrial Arts.

Previous Studies

The lack of literature on Industrial Arts education is not surprising when one considers how slowly educational ideals change and how long it takes accepted ideals to become common practice. It was only fifty-five years ago, at the 1884 convention of the National Educational Associa-
tion, that Felix Adler proclaims in an impressive speech that what he then called "technical work and art work" were "elements of that broad culture which all human beings should possess." He said that they are an indispensable feature of the school system. This statement, as one might expect, was considered as radical and unworthy at the time, but through the constant efforts of a few outstanding men the movement gained ground until now one may find traces of this ideal in every acceptable school subject.

Several writers have worked on certain aspects of the history of Industrial Arts, but the most notable contribution thus far is unquestionably Bennett's History of Manual and Industrial Education up to 1870. This book gives a detailed account of the growth of educational handwork from earliest times to the beginning of the manual training movement in the United States. A later book by Bennett continues the historical study up to the present day.

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Another outstanding study is by Douglas\(^5\) in his work showing the relation of the apprentice to industrial education. Douglas deals with the development of manual training away from its original purpose.

The ground to be covered in the present study is a detailed account of a short period between the years 1880-1891. As the eleven years between 1880-1891 is considered the time when Industrial Arts established itself as a school subject, the writer has delimited his efforts to the study of the thought and action relating to the questions during this time. A better understanding of this period would do much to build a feeling of unity and confidence among those engaged in this work as to its basic objectives. The present day objectives presented are those advised by leading industrial arts authorities and objectives now used in the industrial arts department of the Indianapolis Public Schools.

Terminology

In considering the material assembled in this study, the reader should bear in mind that the "Manual Training" which was concerned primarily with the first ten years of the movement is the same type of work that is now known as Industrial Arts. The changes in the naming of the work have

not always indicated changes in the content or character of the work which the terms were supposed to designate. "In some cases, new terms have simply been attempts to improve upon the preceding ones in describing a little more accurately the work under consideration."  

Manual Training was the original term under which the industrial activity work was introduced into this country following the Philadelphia Centennial Exposition in 1876. Its use at that time was as an all exclusive term to describe any or all of the formal hand training of that period. This original term was used until the year 1904 when C. A. Bennett introduced the new term of Industrial Arts. This was an improvement over Manual Training because it added the ideas of utility and design to the skill and hand training of Manual Training. In 1904 the new term of Industrial Arts  

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was introduced. Vaughn and Mays 10 imply that the term Industrial arts is another attempt to give an appropriate name as a means of promoting a better conception of the content of the industrial activity work which has developed in the United States under the old names of "manual training" and "manual arts."

Bennett,11 in an editorial in the Manual Training Magazine, concludes that manual training, manual arts, and industrial arts are almost identical. On this point he says:

Our observation indicates that representative work being done today under the name "Industrial Arts," or "Practical Arts," is almost identical in content and method with equally representative work under the name of "Manual Training," and likewise with work done in other places under the name of "Manual Arts." Any differences are chiefly in the minds of the promoters of the work, not in the work itself.

To further show the extent of confusion regarding terminology, a study by W. E. Warner 12 shows that, although sixty-three different types of industrial work were offered in the Ohio junior and senior schools, the teachers of the work classed in the study agreed that their courses referred to the same or a very similar kind of school activity work.

The opinion of Warner just quoted is in accord with that of Stombaugh who summarizes the various terms and types of work in Industrial Arts in the following statement, "It seems that regardless of the term used to identify the work, the central concept is to give the child experiences through a school activity of an investigative nature in which handwork is an important and necessary element."

Method of Procedure

The procedure will be a study of statements regarding Manual Training made by leading educators during the time the subject was struggling for a place in the curriculum. The method, therefore, will be to study the addresses and proceedings of the National Education Association during the years 1880-1891 for statements that bear upon Industrial Arts work.

The selections are necessarily disconnected, except that all relate more or less to the questions under study.

For generations the leaders in the field of education have been people whose thoughts and actions are brought to light in meetings and conventions of the National Education Association. As the proceedings and addresses of these

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meetings have been carefully recorded, it is possible to examine the original viewpoints of these leaders regarding any new educational method or theory.

The individuals referred to as leaders in this study have been so rated because of their experience, position, or contributions. The fact that they were invited to express their views before the National Education Association conventions would suggest leadership.

The source material for the early period of manual training is limited to the reports of the National Educational Association for it is in these records that one finds the all-inclusive original claims of the movement.

The present day material was selected from three sources.

1. Results from previous research on subject.

2. Outstanding textbooks on subject.

3. The present Industrial Arts course of study of the Indianapolis Public Schools. This course of study was selected because of the following reasons:

   (a) It was one of the first cities to include Manual Training as one of the regular school subjects.

   (b) The Board of Education records show the early objectives of the work.

   (c) The Indianapolis Industrial Arts department is considered outstanding because of its director Harry E. Wood, a recognized authority in the field of industrial arts.
CHAPTER II

HISTORY OF THE MANUAL TRAINING DEVELOPMENT

In the United States, manual training came into being partly as the expression of a new educational philosophy and partly from criticism of the schools by the public. Many people felt that the schools were spending too much time on mental training. E. E. White in a speech before the National Education Association convention of 1880 made the following statement: "The day of mind, with skill of eye and hand, has dawned. How can this training be provided?" White continues by stating that the school curriculum was too bookish and that it should be broadened to meet the needs of children.

In the traditional school of 1880 the outcome fell short of its possibilities because its appeal was mainly to the mind. It was an easy philosophy to administer, but the public didn't feel that it was preparing the child for practical living. The duty of the school at that time was to present

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to each generation that part of the accumulation of knowledge that was thought necessary. The child was measured by his ability to remember and produce a certain amount of this knowledge. The standards of measurement were never in terms of use or growth. The methods of instruction offered no avenue of expression other than memorization. Lessons affected little change in the lives of the learners.

Early History of Movements

The beginning of the manual training movement in the United States seems to have had its real start, according to Anderson,2 from the time Prof. John D. Runkle of the Institute of Technology went to the educational exhibit at the Philadelphia Centennial Exposition in 1876. This exhibit contained a full account of the methods used in Russia and illustrated the system with a complete set of models. The system made rapid gains after the introduction of the Pestalozzi and Froebel educational theories. These theories were based upon the belief that children are educated through the senses rather than by pure intellectual processes, and that handwork therefore had a distinct educational value. The child secured self-expression and mastery by the use of

In Russia the system was not intended to train for specific trades but solely to train the eye and hand, and to develop accuracy. 3

Prof. Runkle was greatly impressed by the Russian exhibit and soon became an enthusiastic propagandist for this new idea in education. He approved this new method because in his opinion such instruction was necessary in the life of the student in order that he might better round out his general education, which should have for its aim the preparation for the common duties of life.

With the establishment of the Manual Training School in St. Louis under the leadership of Calvin Woodward the manual training school movement "was given its American name, form, and significance as a means of general secondary education. 4" Woodward was the first to use the term "manual training" for this new form of education, and it was he who, in the early days of the movement, was one of its most ardent advocates in the field.

Another early form of this movement was the establishment of the Boston Whittling School. Its original aim, as stated by Stambach, 5 "was to give wholesome and enjoyable

3 Paul H. Douglas, op. cit., p. 177.
4 Ray Stambach, Ph.D., op. cit., p. 31.
5 Ray Stambach, Ph.D., op. cit., p. 21.
work of a type in which the pupils would engage." The value of the work was considered to rest in the activity rather than in the skill or tool processes. Consideration was given to the creative and constructive impulse of the pupil.

The grammar school activities were influenced by the Swedish Sloyd system. This type of instruction was based upon the use of the knife to make small projects. This was an improvement over the Russian system in that the doctrines of interest, individual differences, and gradation of difficulty of learning material were at least partly recognized and provided for.

Manual Training in Indianapolis Public Schools

Information regarding the real beginning of manual training in the public schools of Indianapolis is found in letters written by W. H. Bass. These letters show that Mr. Bass was the first official manual training teacher in the city. The Seminary referred to in the letters was the beginning of the old Shortridge High School located on Pennsylvania and Michigan Streets.

The history of this first class is recorded in the letter below.

The first manual training class was held in the Seminary building and was called the wooden school.

This was in the year 1861. H. S. Tarbell was Superintendent of Schools and W. W. Grant was principal of the High School. George Merritt, Clemens Vonnegut, Sr., members of the school board, and Thomas H. Sharpe, of Fletcher & Sharpe, Bankers, was interested in the idea of manual activity as an educational aid. The three men put up $300 for the equipment; and, the tuition charged to the boys paid the instructor, Prof. Wm. F. H. Coos, of Purdue. This was done for the purpose of securing some sort of data upon which to base an opinion as to the value of such work in education, and also to determine whether the work would meet with the approval of the people.

The work was sponsored by school authority, without formal action of the school board; was held in a public school building, and was, in fact, the real beginning of Manual Training in the Public Schools of Indianapolis.

It was then decided to put the work into the High School beginning in 1884; but a change of Superintendents during the summer led to the temporary abandonment of the project. However, the work was introduced in September 1888, and the Superintendent, Lewis H. Jones assigned me to the work.

(Signed) W. H. Bass

The first official recording regarding manual training in the Indiana Public Schools is found in the School Board minutes of March 17, 1889. It was at this meeting that a committee on textbooks and instruction, together with the superintendent of schools, was instructed to examine the expediency of organizing two classes of manual training, one to be located in high school No. 1 (old Shortridge), the other in high school No. 2 (now grade school #3). The

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7Minutes of Indiana School Board, March 18, 1889, p. 405.
appropriation for this work was not to exceed $1,000 per annum.

One year after the first classes were started the following report was made by the manual training committee:

The years work in the Manual Training Department of the High School has been more successful in every way than we had hoped. The pupils have become able to interpret working drawings whether made by themselves or others, and thus they appreciate the value of drawings as a kind of universal language.

The work in this department has been placed upon the same general footing as other elective studies, and the same credit has been given for it as any other study in making up the requisite number of subjects for graduation. It is believed by your committee that the benefits of such instruction is not entirely or chiefly to those who contemplate following mechanical pursuits; but that it is a part of that practical education which all persons in a community should possess in order to give them right views of the business and social interest of the entire people.

The work became very popular in the two high schools and soon the authorities were considering the advisability of concentrating all the departments of manual training in one building. At this same time a movement was under way in the statehouse whereby a special tax was to be levied to build this new school. Concerning this levy the special committee on manual training made the following report:

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8 Minutes of Indiana School Board, July 1, 1889, p. 40.
9 Minutes of Indianapolis School Board, May 1, 1891, p. 349.
Under the law enacted by the recent legislature allowing the School Board to levy five cents on each one hundred dollars of taxable property for the purpose of establishing and maintaining a Manual Training School, in connection with the public schools. Such funds became first available during the spring and autumn of 1892.

The new building was ready for classes in the fall of 1895 and today is known as the Emmerich Manual Training High School.

A warning regarding the general objectives of the work was given by the Supervision, Examination, and Manual Training Committee in their May 6, 1892 report \(^{10}\) to the School Commissioners. The report in part states \(^{11}\) that in no case should the manual training work descend to the mere practical details of some handicraft, making its possessor able to practice these details without intelligent comprehension of the principles on which such practice is founded.

As plans were developing for manual training work of high school grade the committee on Manual Training also was thinking about establishing work in the lower grades, but it was not started in the grade schools until 1897. It was then carried on by two teachers until 1901 when another teacher was employed. Thirty-nine years later the depart-

\(^{10}\) Minutes of Indianapolis School Board, May 6, 1892, p. 567.

\(^{11}\) Ibid., p. 570.
ment has grown until there are now forty-three grade teachers in 60 shops teaching 5437 pupils.

Industrial Growth and Its Relation to Manual Training

The greatest strides in the industrial growth of the United States were made after the Civil War. It was during this time that we find the mass introduction of the machine in our factories, which resulted in the gradual breakdown of the craftsman-apprenticeship system. The master-apprenticeship relation gave way to the employer and employee.

The new industrial development made a great change in the life of the apprentice. He formerly was in close contact with his master who usually trained him along cultural lines as well as teaching him a trade. Now the employer was too busy making and marketing his wares to help his workmen with their letters or arithmetic. Douglas gives the following reasons for this decline in apprenticeship training:

1. New machines replaced a large proportion of the skilled craftsmen. Only a few workers needed to know all the phases of the work. Those who worked the machines learned one small operation in several hours.

2. Employers thought it was unprofitable to train men. There was no guarantee that they would

12 Practical Arts Department, Indianapolis Public Schools, 1940.

remain in their employ. Other firms could hire them away.

3. Parents and the boys thought it was a waste of time to train for the trades. Overalls and greasy hands did not appeal to the youth as did such jobs as errand, messenger, and office work.

4. The new aim of the factory was to produce as much as possible.

5. The workmen in the shop saw the apprentice as a potential rival. The workman was valued as a producer, not as a teacher. He was also unfitted to instruct the new apprentice.

With the decadence of apprenticeship, the training of the boy for life itself, a new educational problem developed. Accordingly we find the public and school men using manual training to solve this new problem.

As the manual training movement developed, it grew to have quite different principles and aims from those the founders had intended. Concerning the change Douglas writes: "It was used in the schools, but unlike Russia, it served as a basis for some trades or as a means of training workmen."

Other causes for the development of manual training away from its original objectives were:

1. Creation of independent manual training high schools removed the work from the cultural spirit of the traditional schools.

2. The urge to prepare for a vocation was stronger than the broad cultural education viewpoint.

3. Due to the tremendous industrial strides in the United States there was a shortage of trained machinists.

For a long time the supporters of manual training protested against this change. Woodward\(^3\) declared in 1890 that,

> In a manual training school the aim is not the narrow one of learning a trade. Neither is dexterity sought in special operations which may be small parts of even a trade. The object of every feature is education in a broad and high sense. Its influence is subjective. In the case of tools, intelligent use, rather than dexterity, is aimed at. Someone has suggested manual culture was a better name than manual training inasmuch as the manual features take on so clearly the form of culture.

Despite the efforts of the manual training supporters the work gradually became regarded as a means of giving an all-around mechanical education which would increase the pupils' industrial efficiency. In 1909, Prof. Woodward\(^4\) himself stated, "By multiplying manual training schools we solve the problem of training all the mechanics our country needs."

Present Day Industrial Arts Problems

Industrial Arts teaching has passed through, or is

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passing through, three stages of evolution, starting from its inception after the Philadelphia Centennial Exposition.  

1. Manual training ..........1876  
2. Manual arts ..............1894  
3. Industrial arts ..........1910

Evidences of all these stages are to be found in various schools. Some schools still emphasize training the hand in a high degree of skill on exercises as typified by the first stage of manual training. Others, and perhaps most schools fall in this group, if one uses the studies offered in Ohio Schools a as any indication, have changed the emphasis on skill and exercises to projects that involve more utility and design.

This emphasis is traced to the Sloyd Schools of Boston which were established in 1888 and are known as the manual arts stage. Others are shifting to the latest stages of industrial arts where emphasis is placed on the social economic values of practical, exploratory and creative activities. This latest stage of evaluation can be traced to the influence of Frederick G. Bonser. b

The Ohio study by Wagner shows to what extent some

phases of the work are stressed over others.

There is confusion as to the avenues which this branch of education should take. The methods used in the schools in the report seem to show that they are of many opinions as to the general aim of Industrial Arts education.

Smith\(^\text{10}\) said in his report to the American Association of School Administration, "Industrial Arts does not refer to the manual training exercises of fifty years ago, but to the enlarged, modernized, enriched and vitalized forms of what was once termed "Manual Training."

The old manual training placed too much emphasis upon the formal drill and tool processes. It over-emphasized skills at the expense of related information. Modern Industrial Arts instruction seeks, among other things, to provide an appreciative understanding of the world of work.

Industrial Arts teachers, like all others, should have a comprehensive view of the growth of their subject to aid them as they form their future plans for the work. Unless the shop teacher does have this knowledge, his field is likely to become as narrowly formalized as has the academic. In fact, in many instances the work of the Industrial Arts de-

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\(^{10}\) Homer J. Smith, \textit{Aims and Types of Industrial Education}, Paper presented at the Atlanta convention of American Association of School Administration, (1938), p. 11.
partment has become formalized to the extent that it is not serving the purpose for which it was intended. Unrelated drawings and exercise projects to be made by all the students, may be as bad as any academic subject which the child is required to take and for which there is no felt need. Although objectives and methods have long been established for industrial arts, administrators and teachers have not had a clear idea or conviction of the place or purpose of this department in the educational system.

Some writers indicate that methods have been largely influenced by tradition and what others are doing rather than by a thoughtful analysis of the problem. Richards reports that, "Unfortunately, trade methods and trade traditions have influenced the character of manual training work in schools altogether too much."

King states that, "If there could be a standard of pedagogical aims and requirements it would be profitable."

Randolph also suggests a way out of the dilemma.


According to his belief, much criticism of educational methods could be eliminated and better teaching result: "If, for the subject a reliable history of the development of the teaching practices and of the determining conditions underlying them, were available."

The eleven year period from 1870 to 1881 was a period of normal progress for the normal teaching movements. Yet, in making this rapid growth, it aroused the active opposition of some conservative educators who did not recognize the value of normal training in general education and who feared that its introduction would reduce the academic standards of the schools. While the question of the value of normal training was discussed in every corner of the country, it centered in the conventions of the National Education Association, where the leaders of the movement worked for ten years before the subject was finally unanimously accepted as worthy of a place in the public school curriculum.

Proceedings and Addresses of the National Education Association Session of the year 1880

In 1883 the National Education Association held its annual convention at Chautauqua, New York. The discussion of the value of normal training received the first general
CHAPTER XIII

ORIGINAL OBJECTIVES OF MANUAL TRAINING

The eleven year period from 1880 to 1891 was a period of marked progress for the manual training movement. Yet, in making this rapid growth, it aroused the active opposition of some conservative educators who did not recognize the value of manual training in general education and who feared that its introduction would break down the academic standards of the schools. While the question of the value of manual training was discussed in every corner of the country, it centered in the conventions of the National Education Association, where the leaders of the movement worked for ten years before the subject was finally unanimously accepted as worthy of a place in the public school curriculum.

Proceedings and Addresses of the National Education Association Session of the year 1880

In 1880 the National Education Association held its annual convention at Chautauqua, New York. The discussion of the value of manual training received the first general
attention of the convention when A. F. Marble presented the viewpoint that it would be courting failure if manual training were established in the public schools on a trade basis. The report goes into detail to show that schools are not to stuff students with knowledge, but they should stimulate a desire to know and to develop self expression; not to teach trades, but to develop the faculty to learn any trade.

Mr. Marble then told in considerable detail how changes in our way of living have demanded changes in our school work. Formerly the simplicity of rural life, the struggle for a livelihood with the forces of nature in the open fields, and the habits of society made a place for the boy's work. Boys had to do for themselves. They could be useful. Today we do not find a place for child's work. Industry has made many changes in our country. There are now many divisions of labor. Machinery has taken the place of hand tools. Now the question before the country is how can the schools give this useful training to the children of our country.

Mr. Marble expresses his opinion on the question as


\[2\] Ibid., p. 22.
The public schools can never turn out artists or artisans. Their object is elementary training such as will be useful in any pursuit, and not the fitting for a particular pursuit. To do this well is all they can do. To annex special training for the trades upon the public school system is to court failure.

A second paper dealing with manual education was by Dr. W. T. Harris. This report showed that the idea of manual education had been ably expressed one hundred years previously, when Rousseau, in his celebrated treatise on education, stirred the thinking minds of Europe when he gave utterance to the following words:

Reading is the great misery of children. . . . The pedagogs teach children nothing but words. . . . What the human mind receives is conveyed through the senses; the senses are the basis of the intellect. Our feet, our hands, our eyes, first teach us philosophy.

At this same convention Dr. J. D. Philbrick spoke before the departments of superintendents regarding some of the complaints that were then being hurled at the public schools. The most outstanding criticism was that the schools failed to produce practical results. In one paragraph of this re-

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3 Dr. W. T. Harris, "Textbooks and Their Use," The Journal of the Proceedings and Addresses of the National Education Association, (1880), p. 102.
port Dr. Philbrick makes the following statement:

The schools educate the mass of the pupils out of their sphere, and send them out into the world with a distaste for manual labor and un­fitted for the life for which they are destined. The complaint is, not that they are wanting in mental culture, but that they are graduated without possessing the practical knowledge and manual skill requisite to earn a living, and without the disposition developed to acquire such knowledge and skill.

The next speaker on the topic of manual education was E. E. White, at that time president of Purdue University, whose paper covered the decline of the apprenticeship system and objections to teaching trades in the public schools. This report showed that the state has a right to teach any branch of knowledge that will promote the general public welfare. In other words, it is the duty of the schools to provide training and to teach knowledge of a general application and utility to all. Our schools are common schools, schools designed to impart a common education — an education open to all and useful to all. The speaker mentioned several times that it was not the duty of the public schools to teach trades, and an attempt to do this kind of work on a large scale would subvert public education from its primary purpose.

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and end in disappointment and failure. Manual training can in some cases be used as a basis for some later technical training but its chief merit is in its value to all youth, whatever may be their future occupations or positions in life. It must be useful as a general preparation for all pursuits. The report continues with two reasons why it would be unwise to teach trades in our public schools.

First, there are over 336 different kinds of jobs listed in the last census and it would be impossible to teach even a small fraction of this large number. Second, the teaching of a few trades to all would greatly overcrowd that field.

Mr. White goes on to explain that

These objections do not apply to the training of pupils in the use of hand tools and simple mechanical processes when such training is made a means of general education. Train the eye, the hand, the mind for educational purposes. Such training is not the teaching of trades or handicrafts, but is general technical training, and has a place in the public school course. The public school cannot be made a workshop for the training of apprentices, but it can and should give such general technical training as underlies all industrial pursuits.

Proceedings and Addresses of the National Education Association
Session of the year 1881

In 1881, at the convention of the National Education

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Association, held at Atlanta, Georgia, N. A. Calkins presented his viewpoint regarding the development of a true education based upon mental and moral power. Mr. Calkins sums up his opinions in the following paragraph:

"Right methods of education make the pupil an active doer, not a passive receiver, — (no cramming of knowledge). It is what he does for himself — his personal experiences — that educate him. The teacher cannot think for the pupil. His true function is that of a stimulator and guide. He ascertains the need of the pupil, awakens in him a desire to satisfy it, then leads him to the source of supply, and teaches him to help himself, both from nature and from books. The child learns by observation, examples, and practices, not by precepts, rules, or theory. Precepts and rules aid in remembering that which is learned by observation and practice."

This convention also brought forth another notable paper by F. L. Soldon. In this report the writer advocates a school education which does not merely educate the memory, but also the senses and the hands, increases the abilities and adaptability of the students. The farther the abilities are developed, the greater is the field in which he can choose a vocation.

"Summarizing his report, Mr. Soldon" said:


Education must teach the child to find content and happiness where alone they will not flee: in his own heart. A hand ready to help, a contented mind, an appreciation of those treasures that are higher than life itself, this is the ethical task which the century demands from the school.

The report goes on to explain that the public demands that the school should be more life like. As for evidence of the tendency of the schools and the teaching profession to do justice to these demands several progressive school systems offering drawing and manual training are cited.

In the opening address the president, E. E. White, opened the meeting with the following statement:

The primary and imperative duty of the public school is to provide instruction and training of general application and utility. The youth must be prepared to be, to do, and to enjoy the most possible in life. Whatever is taught must be an element in general education.

The report continues with a statement that the public schools may teach the training of the hand and eye as long as the program is general and covers all pupils. Mr. White says,

It also follows that it is not the duty of the public school to teach special trades which have

8E. E. White, "Opening Address of Industrial Section," The Journal of the Proceedings and Addresses of the National Education Association, (1881), p. 239.

9Ibid., p. 239.
only a special application to a few. The training must provide an efficient general preparation for all pursuits.

L. S. Thompson then gave a report on the decay of apprenticeship system in this country. This paper goes into detail on the causes and effects of the decline of the apprenticeship system and suggests as a remedy that we give a more practical tendency to all our teaching. Machinery is cited as the reason why many must change their work; therefore the workman must be prepared to quickly take his place in some new position. To do this the speaker says,

He must have a general education with practical bearings in order to turn from one vocation to another. Trade education unfitts him for such changes.

Proceedings and Addresses of the National Education Association Session for the year 1882
Saratoga Springs, New York

In 1882, a committee on education made an important report at Saratoga Springs, New York. This committee was made up of seven educators, of which Francis A. Walker, president of the Massachusetts Institute of Technology, was chairman, and John S. Clark of Boston was the secretary.


11Charles A. Bennett, op. cit., p. 360.
This committee made the following recommendations:

The introduction into grammar and high schools of instruction in the use of tools, not for their application in any particular trade or trades, but for developing skill of hand in the fundamental manipulations connected with the industrial arts, also as a means of mental development.

At the National Education Convention for this same year Prof. J. W. Glenn reported on results of a survey of fifty leading newspapers regarding the faults of the educational system. This survey gives us a rather complete idea as to what the public thought about the schools. The results in brief are as follows:

1. It is surprising to see the great numbers of evils that are charged to the old system of education.

2. Regardless of the evils the schools are recognized as a great power in the land.

3. Streets are filled with graduates learned in Latin and Greek but unable to make their way in life.

4. There must be more practical tendencies in our teaching.

Mr. E. E. White then gave a report describing the provisions of the land grant act. By this act over eleven


million acres of public domain were set apart and consecrated to industrial and agricultural education. The report shows that in order to live up to the provisions set forth in this act the schools must promote a liberal and practical education. The act does not exclude classical studies and as many of them may be taught as are deemed necessary to afford a liberal and practical education.

By this time, every statement made regarding industrial education in the schools was being examined carefully by the conservative educators. Speakers were asked to give proof for all claims made. It was before this critical gathering that Dr. C. M. Woodward,\(^1\) author of the oft-quoted epigram, "Put the whole boy to school," adroitly began his address on Manual Training by quoting from the highly honored New Englander, Ralph Waldo Emerson:

> "We are students of words; we are shut up in schools and colleges and recitation rooms from ten to fifteen years, and come out at last with a bag of wind, a memory of words, and do not know a thing. We cannot use our hands, or our legs, or our arms."

Mr. Woodward admits that the above statement is rather strong but he says that its main value would be in "aiding the cause for a reform in education."

The address continues with an evaluation of the old education. Is it as broad and round and full as it ought to be? Is there a lack of harmony between the school house and the busy world that surrounds it?

While answering these questions Dr. Woodward gives a clear accounting of his opinions regarding benefits of manual education by explaining that next in rank to the ability to think deeply and clearly is the power of giving clear and full expression to our thoughts. Give pupils clear and accurate thoughts of real things, of the material world we live in, of the laws of materials, of qualities, and of quantities before you start in the field of abstractions. "Make sure of the low arts before you cultivate the high ones." The low arts are needed as a foundation for higher accomplishments. As Emerson\textsuperscript{15} says (in "Mans the Reformer") "We must have a basis for our higher accomplishments, our delicate entertainments of poetry and philosophy, in the work of our hands."

Along with these clear thoughts as stated above we must discourage children in being satisfied with obscure and half grown mental images which are harmful in the development of clear thinking. Let the children use and handle concrete things.

\textsuperscript{15}ibid., p. 146.
The four possible methods of teaching, -- oral, written, graphic, and practical explanation are not all being used by the schools. Dr. Woodward\textsuperscript{16} says, "so far we are only using the first three methods and we have produced nothing but theorists -- if we are to produce practical men we must also include the fourth method." Education of hand and eye must go along with education of the mind. We will then be educating both good workmen and good intellectuals. This can be done at the same time.

To show how this can be done the speaker gives a complete history of his school in St. Louis. In stating the objective of the school Dr. Woodward\textsuperscript{17} says,

Our school is not managed on the assumption that all who go through it will become mechanics. Our graduates find their way into all lines of work. We do not manufacture articles for sale nor do we pretend to teach trades. Such a course may work well in monarchies, where the groove in which he is to run is cut out for him before he is born, but it is unsuited to the soil and atmosphere of America. A single trade is educationally very narrow. The arts are few, the trades many. The arts underlie all trades; therefore, let us teach them as impartially and thoroughly as possible. . .

The following quotations from Rousseau's\textsuperscript{18} "Emilius" were then given by Dr. Woodward to show that others before

\textsuperscript{16} Ibid., p. 147.
\textsuperscript{17} Ibid., p. 148.
\textsuperscript{18} Ibid., p. 156.
him had recognized the importance of manual education.

To know how to use ones fingers gives a superiority in every condition in life.

If instead of keeping a boy pouring over books, I employ him in a workshop, his hands will be busied to the improvement of his understanding; he will become a philosopher while he thinks himself only an artisan.

In closing his address Dr. Woodward admitted that the struggle would not be an easy one. The traditions of the school were against the new education. The new methods and aims were a direct criticism of the methods and aims of the established system, and nothing was more natural than for that system to resent these criticisms.

The last convention speech on the new education was presented by O. T. Fairchild, at that time president of Kansas State College. This speaker called attention to the fact that most of the people in this country agree to the necessity of a general training to think, but oppose anything like a general training to do.

Mr. Fairchild thought that accuracy in the use of both hand and eye, gained in the use of tools was a source of strength when accuracy is needed in other lines. He suggested the adoption of a broad range of manual exercises as a means of developing dexterity of the hands which would lead

10 Ibid., pp. 166-68.
to the ability to do, acting and thinking being the chief source of training in developing this ability to do.

Regarding the teaching of trades in the schools, Mr. Fairchild\textsuperscript{20} made this statement:

The school that drives a youth to a trade is doomed to fail. Each pupil must put in training that shall give a broader, not a narrower, ability. General ideas must rule.

Proceedings and Addresses of the National Education Association Session for the year 1863
Saratoga Springs, New York

In 1863, at the convention of the National Education Association, held again at Saratoga Springs, Dr. Woodward\textsuperscript{21} spoke on the narrow, misleading, and deforming influences of our popular system of education. He protested strongly against the policy of walled in the child with books and confining their attention to a fractional part of what should be their birthright. The speaker did not object to the classics in the schools but felt that they should only occupy their proper place and share of attention. They should not crowd out what to ninety-nine out of one hundred pupils is more useful and valuable. Literary and scientific culture

\textsuperscript{20} Ibid., p. 168.

should not be underrated but must be included as elements in a just proportion.

Practical education as a part of this just proportion is an education of hand to skill and of brains to intelligence. This combination will give the highest kind of directive power.

While speaking on the interest aroused in pupils while engaged in useful study, the speaker made the following remark, "When the limit of attention and lively interest is reached in any subject, then you have reached the limit of its profitable study." 22

Mr. Woodward then defined the term liberal education. To him the word liberal meant free. A truly liberal education educates for all spheres of usefulness; it should furnish a broad foundation on which to build the superstructure of a happy, useful, and successful life.

In defining the education of the hand the speaker claims it is a means of a more complete and efficacious education of the brain. Dr. Woodward 23 then said,

By manual training I do not mean merely the training of the hand and arm. If the school should attempt the very narrow task of doing merely that

22Ibid., p. 91.
23Ibid., p. 87.
of teaching the manual details of a particular trade or trades, it would, as Felix Adler says, "violate the rights of children." It would do the very thing that I have all the while been protesting against. That is what has been done in the majority of European trade-schools. They have no place in our American system of education.

The address concludes with a report on the value of manual training as a means of keeping pupils in school. Dr. Woodward read the following figures which were the result of an extensive study by Superintendent Henadale, of Cleveland, Ohio.

Educational History of 108 Cleveland Children

Out of 108 pupils that enter primary school

- 60 complete primary school
- 20 complete grammar school
- 1 completes high school

The speaker claimed that the present educational system was based upon the few cases of those who complete high school. Many of those who drop out stated that they were wasting time in school. A more practical education was suggested to remedy this condition.

In a report dealing with the moral influence of manual

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24 Ibid., p. 91.
training Dr. J. R. Buchanan said, "The intellectual culture of active art is far more vigorous than that of literature, and makes a far better preparation for business of any character."

The report goes on to show that children should live in an atmosphere of freedom. They crave bodily motion, not restless motion, but the doing of something which gratifies their intellect, curiosity, and ambition of achievement. To do all this it is necessary to include the skillful, industrial occupation in the education of youth no matter what his future is to be. If this industrial element is not included we are depriving the child of a normal development.

Defending his statement Dr. J. R. Buchanan goes on to say,

In literary culture we feebly grasp ideas by their association with printed words. There is no life. In industrial arts we are continually stimulated by the presence of the object, and the operations we are performing, and our perceptions are clear, positive, and exact. It is such perception that invigorate the mind and give it self-reliance. While in literary study the mind is in a passive or negative condition. In industrial arts the mind is in an active and positive condition.


26 Ibid., p. 39.
Defining true liberal education the speaker quotes the definition of the Rev. H. Steppins as follows:

Liberal education is the discipline of the man, putting him in the widest relations with humanity as a general preparation for life in whatever sphere he may be called to act.

Dr. Buchanan claimed that industrial education would provide this general preparation for life, while the old-fashioned education would produce a half-developed man.

The speaker referred to the Empire of China where literary education is the basis for honor and political power as being a good example of mental stagnation and literary culture.

The address closed with the suggestion that schools should not teach drawing and design alone but should include more actual project work. The value of drawing is recognized but practical power is developed best when doing is the result of action and thought.

The next paper dealing with industrial education was by W. S. Perry. The speaker felt that the important educational problem of the day was to provide some kind of industrial training that would be of fundamental value in general

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27 Ibid., p. 40.

Mr. Perry stated that the public schools cannot give what is called a technical education, that is, an education which shall prepare for particular trades or industrial occupations. Nevertheless the growing importance of industry in America makes it necessary that our public education consider the future industrial demands by providing for the development of manual power, skill, and taste.

M. A. Newell, at that time State Superintendent of Public Instruction in Maryland, made a talk before the superintendent's department on the chief obstacles to successful results in the school. The main reason so many pupils were dropping out of school was because our school systems were not adaptable to the needs of the day. The speaker said,

Much injury results from the disassociation of education and labor under our present system, two things which God hath joined together and which man ought not to put asunder. I believe that a child needs to learn to drive a mule just as much as he needs to learn to read. In some way this deficiency must be remedied, if elementary education is to be made universal.

Proceedings and Addresses of the National Education Association Session for the year 1884
Madison, Wisconsin

While addressing the general assembly on the subject of manual training, Dr. L. W. Becknell, then president of the association, called attention to the following remark.

20 M. A. Newell, "Obstacles to Successful School Results," The Journal of the Proceedings and Addresses of the National Education Association, (1883), p. 79.
made by Dr. Felix Adler: 30

I firmly believe, that the state violates the rights of children when it undertakes to prescribe their future career during the school age, and that the public system of education should be kept free from any subserviency to the 'bread and butter' interest of later life.

Regarding his own opinion on the new education Dr. Becknell 31 said:

The true theory, as we maintain, is that in which labor is regarded as a means of mental development; that the education of the hands shall be the means of more completely and surely educating the brain; that to introduce trades into the schools is to degrade the schools . . . . . .

The speaker felt that the common school had no specializing functions, but that they could perhaps aid in the industrial processes in an indirect and general way. We should not expect too much from the schools. The school life is too brief and its opportunities too limited to expect that a youth shall come forth full rounded for the battle of life.

Referring to some of the schools that had already included manual training in their course of study, Dr. Becknell 32 said:

30 Dr. L. W. Becknell, "The President's Address," The Journal of the Proceedings and Addresses of the National Education Association, (1884), pp. 32-76.
31 Ibid., p. 56.
32 Ibid., p. 57.
The fault has been in America, as in other countries, that people look too much to the economic or commercial side and too little to the hand-work education in training the mind itself. Until there is a general idea that hand-work education is for something more than to teach boys and girls to earn money, industrial education will amount to little. So far as we make hard-work and head-work go together in school, without regards to pecuniarily profitable results, success may be expected.

Dr. Becknell closes his address by reading the following editorial on the new education. This editorial was written for the Pioneer Press of St. Paul, Minnesota.

Those who welcome this reform at once do but anticipate the future, when the children of the Nation shall no longer be given a stone in answer to their pitiable cries for bread.

The second paper on manual training was given by Colonel August Jacobson. This speaker was a layman and had no connection with the public schools. He was interested in the movement and had made an intensive study of the results that had already been accomplished in the schools that offered this type of instruction. Colonel Jacobson thought that skill was very important and that manual training developed the foundation for general skill. If the skill is general the pupil increases and multiplies his chance of employment.

Ibid., p. 58.

in many different lines of work. This skill is very important from the speaker’s point of view. He claims that it is not necessary to prove that the mental progress of the pupil is as great as if he devoted all his time to study instead of part for hand-work and part for study. But those who have tried the work, claim that the mental progress is as great as if all the time were devoted to the study of books.

Regarding the teaching of trades in the schools, Colonel Jacobson says:

Manual training work does not train mere mechanics. The mere mechanic is a man with only one skill. When a new machine is invented that can do the one thing he can do, he is left helpless. Not so with the manual training boy. He does not know the word helpless. By applying his brains and his eyes, and his hands to books, tools, and materials, he has learned the great lesson of power. His brain has learned to plan and his hands have learned to do what his brain plans. He has learned that things will yield and he has learned how to make them yield. His intelligence and skill fill him with power.

The paper goes on to answer a question often asked regarding manual training. That is, if we teach the use of tools to boys, will that not force them to become mechanics? Colonel Jacobson feels that there is no more danger of all manual training boys being mechanics than there is danger

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of all boys who learn to dance becoming dancing masters. As a final statement regarding the purpose of manual education Colonel Jacobson\textsuperscript{36} said:

Manual training work educates boys, not to become mechanics, but to become men of intelligence and skill.

The next speaker on our subject was Dr. Felix Adler.\textsuperscript{37} The purpose of his paper was to advance the claim that tool instruction, work-shop lessons, -- in a word, training, are essential elements of general culture. Dr. Adler's\textsuperscript{38} plea for manual training is summarized in his following statement:

It has a broadening and humanizing effect, because it quickens into activity certain faculties of human nature which too commonly lie dormant; because instead of the present one-sided development, it is a step further in the direction of that all-sided development which is the ideal of education. The school is not a mere training-place for the material interests of life. To do this would debase it.

Dr. Adler did not feel that it was the business of the school to educate operatives, any more than it is their business to educate merchants.

The school should supply these elements of general cul-

\textsuperscript{36}Ibid., p. 303.

\textsuperscript{37}Dr. Felix Adler, "Technical Education as Elements of Culture," The Journal of the Proceedings and Addresses of the National Education Association, (1884), pp. 305-19.

\textsuperscript{38}Ibid., p. 309.
ture, which are necessary to all men and women alike and if manual training can continue to demonstrate that it provides for a broad culture which all human beings ought to possess, then it should by no means be omitted from the school curriculum.

Dr. Adler defends his viewpoint by explaining that the workshop develops the co-ordinating power of the hand and eye. The hand and the eye are two organs that stand in the nearest relation to the mind. The left hand and sure eye, will be of infinite value to those engaged in all pursuits. Even those not engaged in hand work such as lawyers and clergymen would be more human if this side of their nature, the active side, were thoroughly trained and disciplined.

Dr. Adler also placed a high value upon the moral value of manual training. To him the moral equivalents of work-instruction were as important as the mental equivalents. On this point he said:

"Its influence upon the formation of character is nothing short of revolutionary. The pupils grow to love their work, and thus acquire, early in life, that bent toward thoroughness and application which is the surest safeguard against habits of carelessness and insincerity in later years. The co-operation between pupils tends to foster and develop, as nothing else can, that spirit of solidarity without which all culture is narrow and selfish."

39 Ibid., p. 311.
In 1885, the delegates of the National Education Association heard the first report on the progress of manual training in the public schools. This report was given by S. R. Thompson who felt that no educational movement had ever risen so rapidly in public estimation, taken a deeper root in society, or had been established in a greater number of schools than had manual training in the few short years since its inception.

To show this progress Mr. Thompson offered the names of some newly established schools with a brief statement regarding the objectives of each.

**Chicago Manual Training School**

1. General education objectives
2. Mental training not neglected
3. Modeled after St. Louis Manual Training School

**Toledo Manual Training School**

Object of school is to foster higher appreciation of the value and dignity of intelligent labor, and the worth and respectability of laboring men. Special trades will not be taught, nor will articles be manufactured for sale.

New York Hebrew Technical Institute

1. General education for boys
2. No trades to be taught

Baltimore Manual Training School

Same aims as St. Louis Manual Training School or general education. This was the first manual training school supported in full by public funds.

Girard College

Industrial department opened in accord with a clause in Girard's will, where he expressed his desire that the boys shall be taught the various branches of a sound education. The new department shall teach facts and things rather than words and sounds.

Mr. Thompson also read the manual training report of the Philadelphia School Board, part of which follows:

Manual Training is intended to give boys such a knowledge of tools and materials employed in the chief industrial pursuits of our time as shall place them in more direct and sympathetic relations with the great activities of the business world. The school will make our public education not only more complete and symmetrical in character than it has been heretofore, but it will at the same time be better adapted to engage the pupil to win their way in life. No matter what future the parent may have marked out for the boy, it is believed that such an education will be of immense advantage to him. The instruction will be practical in the largest sense of that term. The culture it gives will include the hand as well as the head. The school is organized as a result of a growing interest regarding the character of public education in the Philadelphia Schools.

The Progress report closes with a statement regarding the St. Louis Manual Training School which goes as follows:
Our school is no longer a mere experiment. Leading citizens and business men recognize the value of both its mental and manual training.

This same year a notable address was given by Charles M. Ham. His paper was based upon Bacon's definition — "Education is the cultivation of a just and legitimate familiarity between the mind and things." The speaker referred to the hand as an organ of wisdom and felt that the training of it reacted upon the mind.

A history of tools showing how they had spanned the great gulf between the savage and civilized man showed their great importance to mankind. The paper also showed how world greatness came through invention, engineers, and mechanics.

Mr. Ham stated his opinions on education as follows:

Subjective mental processes such as used in word training schools are automatic, and hence they neither generate power nor promote rectitude. They enfeebles rather than energize the brain. Why store the mind full of facts which are useless until they are applied to things? Manual training promotes altruism, because it is objective. Its effects flow outward; they relate not to self but to the human race.


44 Ibid., p. 260.
At this same meeting an address by Thomas Hampson revealed the information that one of the most frequent charges brought against the common schools of today is that they tend to unfit pupils for working with the hands. It is possible for a boy to pass very creditably through the entire school course in one of our manufacturing cities without having any natural aptitude that he may possess in the way of manual dexterity cultivated in the slightest degree during the ten or twelve years he has been attending school. Mr. Hampson believed that this condition would disappear if manual training instruction could be introduced in our schools.

His opinion on the value of this work is quoted below:

"I may have those before me who believe it to be no part of public education to train the body as distinguished from the mind. If such be the case, I have only to say that that conception of education which embraces anything less than the complete development of both body and mind seems to me as inadequate as it is fast becoming obsolete."

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46 Ibid., p. 156.
In 1886, a committee consisting of Dr. S. M. Peabody, president of Illinois Industrial University; Professor John M. Ordway, of Tulane University, New Orleans; Dr. Emerson E. White, then Superintendent of Public Schools, Cincinnati; and George T. Fairchild, president of Kansas State College, made a report on the "The Pedagogical Value of the School Workshop." The report itself was an effort to define the school shopwork and to indicate its functions in education. In considering the pedagogical value of shopwork the committee reported that one must not expect the workshop to produce workmen, that is, persons skilled in the arts and methods of any trade; but to produce workers, that is, persons whose capacity for work is general, and those who have the ability to adapt themselves to any specific work which they may choose.

Probably the most important conclusions expressed in the discussion was in a statement by Dr. White: "The workshop is deserving a place in the school, only as an educational instrument -- not to teach trades. Hence, if the workshop

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enters the school, it must be for its educational value."

Statements by others on the committee were as follows:

S. H. Peabody — A school workshop, under any condition, is a shop in which the improvement of the worker is the chief aim. The object is to effect, intellectually, the worker. We are to judge the result not by what it does in introducing workmen, but upon what it does for the workers; for example, in general culture.

Dr. E. E. White — The public press generally pushes the economic side of training apprentice but the workshop can only come into the schools upon the pedagogic side. Its chief value is in general education.

J. M. Ordway — We want men who can do — who can execute, and those men must be trained. We are not concerned with specialists, but in educating men and women.

The next paper on our subject was given by C. M. Carter, president of the Massachusetts Board of Education. The paper showed that our manual training schools were an outgrowth of the industrial schools in Europe; whose general aim was to prepare pupils for particular trades. Our manual training schools have a much broader aim, Mr. Carter said:

They desire to give a general development of the pupil, valuable in every occupation. Our schools do show some traces of the European aims but this should not be. This basis is too limited to give general culture of mind, hand, and eye.

The manual training which finally secures a recognized position in our schools must be broad in its aim.

The discovery and application of thought as embodied in things will answer as a broad foundation for manual training.

The same year a notable address was given by G. F. Magoun, then president of Iowa College. In his address, he said:

In putting the whole boy to school you must recognize the value of several types of development in order to make as whole a man as you wisely can. There is no one part of the educating process to monopolize the place of the whole. Each and all must help the whole.

Manual training must be discussed only as education and not as preparation for vocations. The work must be justified not on trade but on general elements. Our object is to make men, not mechanics.

This paper delivered by Mr. Magoun tried to show that there were important elements in both the old and new education. The old education was not full enough to care for the labor group that had just started to fill the school rooms. There was a real need for a more general and practical education. The schools could give a start in this general training by including manual instruction in the curriculum.

Proceedings and Addresses of the National Education Association Session of the year 1887
Chicago, Illinois

It was at the Chicago convention of the National Education Association in 1887, when a definite note of confidence was struck that marked the turning point for manual training. On that occasion, General Francis A. Walker, president of the Massachusetts Institute of Technology, read a paper in which he showed why the city boy needs manual training to make up for the lack of certain experiences which the country boy enjoys, and then definitely recommended manual training for boys in the grammar grades.

Regarding the value of manual training he said:

The strength of the manual training position lies in the claim that such studies are, truly, purely, and highly educational, being actually required, in addition to the familiar studies of the public school, to secure the complete and harmonious development of the powers and faculties of the mind.

While delivering the address of welcome to the Chicago convention, A. C. Story, then president of the Chicago

51 Ibid., p. 201.
Board of Education, made the following statement:

It is neither necessary nor proper to teach a trade at the expense of the State; but, rather, that, by combining industrial work with the teaching of the school, a better method of training the intellect is obtained, insuring greater efficiency in the workman and a saving of time to the pupil, both of which are of benefit to the State.

The address also showed that boys with manual training experience comprehended more readily the oral teaching of the school, and also had a better understanding of what they read. Those, also, who take the manual course of study, are able to carry along the same studies of the regular work as those who do not, thus demonstrating that the exercise incident to manual education is a stimulant to intellectual development.

At the same meeting, L. A. Fay read a paper which suggested that the public schools be more practical in their instruction. After a clear cut discussion of the subject from his point of view, he reached this conclusion:

The right to place manual training in the public schools is not based on the fact that it will make good workmen. We claim that it is needed to give every person an intelligent understanding of things he deals with every day. A man should be as much ashamed of ignorance of the

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simplest facts and principles of mechanics as he would be of not understanding one of the political or financial questions of the day. Therefore, a college professor is the last man who would be supposed to feel the need of manual training.

Dr. C. M. Woodward\textsuperscript{55} then spoke on the public school and its purpose. During his address the speaker made an effort to clear up all misunderstandings regarding manual training. The opposition to the work was weakening, but it was two or three years later before it was completely overcome.

The address itself discussed in detail the importance of training our students so that they would be strong and self-reliant, independent and free. Let their education be first generous and broad before it becomes special. Let it be thoroughly human, by developing all the faculties and sympathies symmetrically. In short, let us "put the whole boy to school."

Replying to one of the critics of manual training, Dr. Woodward\textsuperscript{56} said:

Dr. Dickinson has been misled as to the motive of shop work in the schools; he is afraid of trade or professional teaching - a thing which very few thoughtful people advocate in any public

\textsuperscript{55}Dr. C. M. Woodward, "The Function of the Public School," The Journal of the Proceedings and Addresses of the National Education Association, (1897), pp. 213-224.

\textsuperscript{56}Ibid., p. 217.
school. And he completely fails to appreciate the fact that the fruit of tool instruction is mental dexterity rather than manual dexterity.

Results show that there is not a single element of narrowness, or unmanliness, or unworthiness in manual training.

The discussion that followed Mr. Woodward's address revealed the following opinions:

Professor J. M. Ordway, -- It is an absurdity to talk about the construction of woodwork as leading to the making of carpenters. That is not the thing; we do not teach woodwork. We do not establish a school to make carpenters. We teach them to use their hands and minds.

Besides intellectual training manual work has a great moral influence. The manual training boy learns to be accurate. After he is accustomed to accuracy, it will follow him through life.

Charles H. Ham, -- If we teach work, we shall teach a love of work and that is, in my opinion, the highest morality that can be taught, -- and so I believe in manual training.

President Seldon, -- I am glad to see that manual training has made its appearance in education. I am glad, not for the reason that new results will follow, not for the reason that things can be made for the eye, but for the reason that it deepens the thought process, which is the training, the education of manhood and womanhood for life. You have now the electric light, and you can turn out the old gaslight.

Another notable paper was given by J. M. Ordway.

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57 Ibid., p. 231.

then president of Tulane University, which showed that industrial education was fast becoming an accepted school subject. The paper urged school officials not to lose sight of the real purpose of manual training, that is, general education or the symmetrical development of the pupil in body and mind. Learning to work and being capable of earning a living is recognized as being a good thing, but those who advocate manual work on these grounds alone, are warned to get back on the right track.

Concerning trade instruction he said:

It is not the intention, today, of the advocates of industrial education to teach the pupil any trade or profession. Such would be entirely out of the sphere of the public expenditure of money. This idea has been a bar to true progress wherever introduced.

Professor Ordway acknowledged that industrial education had an economic side, but warned teachers against looking at that side first, last, and all time. The economical value of the work should be secondary to the major general educational value.

The last Chicago report on our subject was given by James H. Baker. This report showed the results of a

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50 Ibid., p. 543.

questionnaire (then called circular) sent out to all schools offering manual training. Questions asked were as follows:

1. Upon what grounds do you defend manual training?

2. How does manual training effect the excellence of the academic work?

3. What are your reasons for the introduction of manual training?

The following general conclusions were drawn from the answers returned:

1. The grounds for its value in public schools are one-hundred percent defended by its general educational value.

2. All reported favorable or at least no harm to academic work.

3. It develops certain faculties not developed in ordinary school work.
   a. Pupils perform other class work with more intelligence.
   b. It gives an idea of the dignity of labor.

4. Schools who devote half their study hours to manual exercises make equal progress in mental work with those who give all their study hours to it.

Proceedings and Addresses of the National Education Association Session of the year 1888
San Francisco, California

In 1888, at the San Francisco convention, W. E. Sheldon\textsuperscript{61}

delivered an address stating his reasons why manual training should be included in the school program. He contended that the work would remove the distaste for manual labor that then existed in the minds of school pupils. The address also showed how manual training developed the physical condition of the young, and thus prepared them for better intellectual training and discipline than they would be likely to receive without it. Still another argument for the work was that a healthy development of the mind through exercise of the senses required that it should have an expressive side, not merely through speech and writing, but through the hand in practical work. This would make the brain more inventive and the hand more executive. The effort a boy made would be of more value to him than the knowledge acquired as a result of the effort.

His viewpoints on the subject were stated as follows:

Our school system should be arranged with reference to the acquisition of such useful and practical knowledge as is essential for the utilitarian purposes of life, and at the same time to secure the highest mental and moral discipline. To demand that the branches taught in the common schools be restricted to the three "R's," however essential they may be, as the "tools of knowledge," or "the keys to unlock higher culture," is to ignore the essential aims of a common-school education.

62Ibid., p. 158.
The speaker quoted the following statement from Herbert Spencer, \(^{63}\) "The child should be taught as little as possible, and induced to discover as much as possible." Or, in the words of the speaker, "Teaching that tends to cramming is not teaching."

During the discussion that followed the above address, Mr. Jerome Allen made the following statement:

We are not here to educate our boys to the trades. We are here to educate our boys and girls to take hold of anything and everything to which they are required to turn their attention. Manual training is to be introduced into our schools so that boys and girls may become well-educated.

Mr. T. S. Thompson's opinions on the work are expressed as follows:

Approach the subject from the seeing side and then pass over from that into the doing. Manual training is nothing more than a form of expressing one's thoughts, feelings, and desires. We have many methods of expression but perhaps we have neglected hand expression. It would be well if teachers would emphasize this more in the future. The more we can extend the reach of our thoughts, the more do we grasp real education and general education.

At the same session, C. T. Fairchild \(^{64}\) read a paper on the limitations of manual training as a means of education.

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\(^{63}\) Ibid., p. 161.

\(^{64}\) T. Fairchild, "Limitations in Industrial Training," The Journal of the Proceedings and Addresses of the National Education Association, (1890), pp. 540-590.
The paper warns educators against over-zealous advocates who maintain that manual training is a cure for all the evils in education. Mr. Fairchild expresses his viewpoints as follows:

The thinkers may be another set of men from the doors. We must combine thinking and doing in the training of youth that the great thinkers can lead in doing as well, and the doors can follow at least the thoughts of the great thinkers. We cannot expect exact work if the worker is to do all the work and thinking. The act of hand or mind which involves mere imitation has little educational value. Bias toward trades can be best avoided by employment of educated men who have studied mechanics, rather than mere mechanics.

R. S. Thompson then gave a report showing that manual training had received a great deal of favorable public approval in districts where schools were offering it. Some of these comments on the work are as follows:

Superintendent R. L. Barton, Peru, Illinois, -- Manual training furnishes hand and eye training, and also mind-growth.

Washington, D. C., officials report, -- It is certain it does not hinder the general progress of any boy engaged in it, and it is equally certain that the influence of the work was beneficial in various ways to the school.

Albany, New York, officials report, --

1. The training gives pupils a wider field of

occupation to choose from.

2. It gives them a sounder judgment of men and things.

3. Affords a better intellectual development.

4. Tends to the elevation of labor.

Dr. C. M. Woodward then gave a report on the condition, methods, aims and results of the St. Louis Manual Training School. The report shows that it is possible to incorporate the elements of intellectual and manual training in such a way that each is the gainer thereby.

Another report at this convention was by Zalman Richards from Washington, D. C. This speaker had made a fifteen year study on the best methods of combining industrial and intellectual training in the schools. His conclusions are listed as follows:

1. All children should be made as familiar as possible with the language and common terms used in the common employment of life.

2. They should be trained experimentally, and practically to a certain extent, in the elementary principles of the common employments and also a proper regard and a mental sympathy.


for the representative of capital and labor - or for the so-called professions and common employments - so that every necessary employment shall be considered honorable and respectable.

3. The manual part of this training should be of the simplest kind in our elementary schools, and should be given with the simplest tools. The most important educational features of manual training can be secured with simple and inexpensive tools.

4. The training should be adapted to all pupils alike. This includes the poorer classes who most need it.

5. It should not interfere with the intellectual training of the pupil, but it should rather serve to make that training more effectual and complete.

Other statements regarding manual training work in general were:

The foundation of a knowledge is the study of things.

Manual training cultivates, as nothing else can, habits of exactness.

Expose the pupils to as many experiences as possible.

The educational power of manual training can be measured by the true mental development brought forth, which consists of the power to observe, to classify and to do.

To show the moral power of manual training, meaning, of course, that industry and crime are not companions, the speaker used the following old sayings:

The devil never goes where he hears the anvil ring.

Idleness is the mother of vice.
In another paper delivered at this convention, T. C. Crawford discussed his viewpoint as to the educational value of mental training. He offers the work as the best means to a real education to those who believe the end of education is being, and as of the highest utility to those who believe that the end of education is in doing. The paper claims that being and doing embrace all there is to be drawn from any life, and the system which produces these in their highest development is the one to be adopted.

Mr. Crawford's viewpoints as taken from his report, are as follows:

Let us educate every power of the whole being, and by the use in manual training of the hand, guided by the eye and put into active operation by the busy brain, educate fully and symmetrically. We learn to be by trying to be; we learn to do by attempting to do. This is the key to every hard problem. Do; keep doing.

Proceedings and Addresses of the National Education Association Session of the year 1889
Nashville, Tennessee

In 1889, at the Nashville meeting of the Association, Dr. C. W. Woodward, seeking to secure the united approval

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of manual training, made the following statement:

Manual training deals with foundation stones; and let me tell you who would leave them out, you are not building wisely. There is something vital in this rational personal experience with the material world which forms the environment of our lives, which broadens the mind, which heightens the intelligence, and which strengthens and ennobles both intellect and character.

At this same convention J. T. Walters\(^7\) spoke on some of the observations he had noted in the manual training schools already established. He observed that the systematic instruction in the use of tools had a quickening effect on the intellectual faculties of the student far beyond the expected limit. The boys who were constructing things were compelled to think, deliberate, reason, and conclude. As he proceeded in his work he was brought into contact with powerful natural forces. If he wanted to control and direct these forces it was necessary for him to first master the laws that governed them. By thus training the hand and eye there was a reaction upon the mind, stimulating it to excursions into the realms of discovery in search of facts to be applied in practical form.

Mr. Walter's survey also showed that wherever teachers

had a fair chance to experiment all were overwhelmingly in favor of the excellent influence upon the intellectual activity of all classes of students, and the former much-criticized proposition of Jean Jacques Rousseau, that "a pupil will learn more by one hour of educational manual labor than he will retain from a whole day's verbal instruction," was being verified in the schools of the country.

The survey also showed that manual training had the very best effect upon the upbuilding of a manly, self-reliant, well balanced character. It gave the pupil food for thought, gave him an insight of the shop, and made him a useful citizen, believing in the noble dignity of labor.

The speaker's definition of the new education was as follows:

Public education should touch practical life in a large number of places; it should better fit all for that sphere in life in which they are destined to find their highest happiness and well-being.

Proceedings and Addresses of the National Education Association Session for the year 1890
St. Paul, Minnesota

The final acceptance of manual training in public education came in 1890 at the St. Paul meeting of the Association.
tion. At that meeting, Aaron Gove, 71 made a report showing that the subject was then regarded as an essential in education. It was essential because it formed habits of correctness; its exercises gave such dexterity that was useful to all, and would enable pupils to acquire readily the skill needed in all lines of useful arts.

The speaker expressed his opinions on education as follows:

During the period of elementary education the chief inquiry as to what subject should be taught ought not to be merely what knowledge will be the most valuable to the pupils in after life, but chiefly what line of subjects and what method of training will become most useful to them as self-helps in the building of the individual. Herein lie essentials of elementary education.

At the same meeting, Jerome Allen, 72 read a paper which showed that even though the clear-headed and earnest educators desired the progressive advantages of this new work, they could not advance against the stand of our public press. The new reform was not being pictured in its true light to the parents. The following example is quoted:


Newspapers persist in advocating manual training on special utilitarian grounds; it will have it that a boy must learn to use the saw because it will fit him to become a better carpenter, and the school girl must learn to sew and cook so she can make bread for her husband, or in case of his death, that she may earn a living for her poverty stricken family.

The paper claims that most parents do not understand the real objectives of the school. Too many of them measure the value of a school by the number of pages their children commit to memory and the number of facts the teacher can cram into their heads. It is useless to talk to these parents about more sensible teaching until they are set straight on the real value of the school.

Regarding the acceptance of the movement on the part of the educators, Mr. Allen said:

We are rapidly coming together, because we are seeing that the aim of education is to make men, not pedants; thinkers, not memorizers. We are realizing that a good thinking-machine inside a pupil's skull, with a good heart and body attachment, is the best equipment a boy can have for the battle of life. So, the war of words over the spelling book and the grammar book and the arithmetic book and manual training, is speedily coming to an end. The science of education is appearing.

Still another report was given by James H. Baker who said:

The foremost question of the day is manual training. Its value is conceded by most educators. I presume that all educators worthy of the name will grant the value of manual training in form of reading, speaking, drawing, exercise, experiment, etc. On the other hand, I will assume the economic value of manual training is ruled out, as most leaders of the movement agree, and that the discussion is on general educational values.

A report which showed the influence of manual education in schools which had been subjected to a test was given by H. M. James. Circulars of inquiry were sent to forty superintendents of schools having manual training. Some of the questions asked were, "What results do you observe?" "What do you think of its value and its influence on other studies?" The results are summed up as follows:

Regarding the effect of this training on the other studies of the course, and its general pedagogical value, superintendents and principles claim that neither can be questioned. There is entire unanimity that its influence is good and its value very great. The testimony of those who had watched it closely shows that it cultivates patience, observation, neatness, and order; that it arouses interest in other studies; that it trains the eye and hand as few studies can; that it teaches how to do and apply; that it trains by the laboratory method, and, that, since it is industrial employment, it has moral value.

Mr. James admits that while the testimony is singularly

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harmonious and the conclusions easy to reach, this does not mean that the jury was packed. The conclusions reached were "the thoughtful judgments of the best informed men of the present day on this important subject."

Another paper was given by John E. Bradley who claimed that manual exercises were important in the formation of correct intellectual habits, not only because they required close attention, but also because they supplied accurate materials for the process of thought. Moreover, the work develops industry, perseverance, and genuineness, which are elements of an upright character. The boy who has learned to apply himself till a specific thing is accomplished, has taken an important step in moral training. Any system of work that will train boys to do things carefully, is of great educational value, though nothing else may come of it. The boy in the workshop acquires the habit of overcoming difficulties, and learns to stick to an undertaking until it is crowned with success. As a whole, the work will enrich and give the whole educational program a new impulse. Nothing will be sacrificed by this progressive movement.

At this same convention Henry Sabin,\textsuperscript{76} then State Superintendent of Iowa made the following statement:

The most practical thing in life is intense action. The most practical education is that which awakens the latent forces; which brings out that which is within; which puts the child in complete possession of himself, and gives him such mastery of his powers and faculties, that whether he holds the plow, or sexes the plane, or smites the anvil, or wields the pen, he shall feel that there is no impossible barrier between him and the highest work which he knows he is capable of doing.

As the concluding item in this study, and also as a means of showing that the advocates of manual training considered that they had won their battle, Dr. G. M. Woodward,\textsuperscript{77} then considered its strongest supporter, made the following statement:

I see fitting to say at the outset, that we have reached a stage in the history and development of manual training when its general educational value may safely be assumed. Its struggle for existence is over, and we can now devote our energies to the work of improving its details.

As would be expected of any new feature in education, there is a great diversity of opinion in matters of detail. Hence it seems highly desirable that in place of arguing longer on its value, we discuss details.


CHAPTER IV

PRESENT DAY OBJECTIVES OF INDUSTRIAL ARTS EDUCATION

During the time between the original manual training development and the beginning of the Industrial Arts period there were radical changes suggested by the leaders of manual training, but none were readily accepted or adopted by the field as a whole. Traditional practices had been inbred in many teachers and they were slow to accept any radical changes. Most courses continued to be organized in orderly, regimented fashion and pupils had little opportunity to do anything for themselves.

Soon after the start of the 19th century several leaders in the field began to criticize the basic educational theories of manual training. In 1902 James P. Haney\(^1\) said:

> Skill is cultivated and discipline maintained, but there is lacking the incentive to that freedom in thought, to that self-reliance in action and individuality in expression which is necessary to the child who is to be trained to be an active, forceful man.

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Four years later Charles E. Bennett\(^2\) criticized the manual training teachers for doing all the thinking for the pupils and for presenting the problems solved, leaving the pupil only the manual work. He suggests it would be better to have the pupil make a study of his problem and then proceed to work it out with the help of the teacher. The common practice of the teacher was to dictate each step in the work.

During that same year, B. R. Payne\(^3\) urged that manual training could be made more educative by developing the respect of the pupil for the thinking side of the work as well as the doing side; and by showing its value as interpreting everyday life. In short he was advocating a shift of emphasis from the product to the child.

Ira S. Griffith\(^4\) felt that it was possible to put too much stress on the thinking side. To him, both the thought and skill sides of manual training should go hand in hand, rather than one side being allowed to suffer because

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James E. Russell\textsuperscript{5} pronounced his opinion against the old manual training methods when he said, 

"Subtract from our present manual training course that which is essentially applied design and those exercises which are intended to afford motor expression in the learning of other subjects in the curriculum, and what is left is an incoherent, unorganized series of projects without purpose or educational value."

He proposed a course to be known as "industrial arts," which was to be a study of the industrial processes and the transforming of raw materials such as foods, textiles, woods, metals, and clays into useable projects. Such a course would include all the stages of production, manufacture, distribution, and consumption.

These criticisms, as well as many others, caused much concern and gradually the general objectives of the work were changed. More emphasis was placed upon the content of manual training rather than upon the acquisition of technical skill, the conception of the subject came to be more that of an educational instrument which would illustrate the achievements of the race and to acquaint the pupil with the fields of art and industry.

Other significant factors leading to the new changes

were the fast development of machinery and the specialization and constant changing of trades. No longer was there a great demand for hand skilled workers in industry. The school even with the most elaborate equipment could teach but a few trades. The result was that the school shop became more of a laboratory in which the pupil could get first hand information about materials and a plan in which he could explore fields that appealed to his interest. These changes were more pronounced in the junior high schools than in the senior high schools. The secondary schools continued to hold a status which fluctuated between cultural and vocational aims.

The vocational phase of industrial education still holds an important place in the secondary schools but today industrial arts or what was formerly known as manual training has come to be recognized as a part of the general educational program, and its objectives are along exploratory and general developmental directions.

In 1928 William E. Warner of Ohio University made a most extensive study on the objectives of industrial arts. His method of procedure and results are as follows. A group

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6William E. Warner, Policies in Industrial Arts Education, Ohio State University Press, Columbus, Ohio, 1928, pp. 53-45.
of fifteen specific central objectives which seemed to fairly represent all the major aims of industrial arts work were evaluated by a jury of 421 people. The jury was made up as follows:

Ohio Industrial Arts Teachers 358
Teachers, administrators, college professors, geographically selected 58
Industrial Arts authorities 5

421

The fifteen objectives were printed and submitted to the jury in the form of individual strips of paper, each piece contained an objective. Each jury was asked to arrange and rank the group according to their importance.

The fifteen objectives were as follows:

Objective A, exploration, was selected because of its frequent emphasis in the literature of the junior high school during the last decade; objective B and C, educational and vocational guidance, because of their growing place in the educational programs of school, since the World War; objective D, consumers' knowledge and appreciations, contributed by Bonser as a result of his analysis of the social values of practical activities, because it aims at the development of knowledges, appreciations, and abilities regarding the more intelligent choice and use of the products of industry; objective E, household mechanics, because of its popularity
since 1920 in the teaching of certain knowledges, skills, and attitudes regarding the installation, care, and repair of things about the home; objective F, social habits and attitudes, refers to desirable traits that may be developed in adolescence regarding practical things, a rather indefinite purpose that has been stressed during the entire fifty year period; objective G, pre-vocational, because of its common use from 1912 to 1925 as expressing the training which leads to vocational accomplishment, although the common tendency now is to drop the prefix and simply use the word "vocational;" objective H, advocational, because its reference to the pursuit of a hobby where the pupils chief interest seems to be in making something; objective I continued - a degree of skill, expresses the modern conception of the place of skill in industrial arts as contrasted with the standard of artisan skill held by manual training; objective J, the seven cardinal principles, is self evident as referring to a group of principles that have been widely stressed in secondary education since its appearance in 1916, objective K, mechanical intelligence, represents the main objective of the advocate of manual training; objective L, correlation, refers to the close integration, of subject matter and the individual activities of children; objective M, refers to the Faculties," which although it has been
long discredited by the findings of psychology, still clings as one of the purposes of shop work; objective N, hand and eye coordination, implies the doctrine of formal discipline which was so popular between 1880 and 1910; and objective 0, vocational training, is another objective regarding which many views have been expressed. These objectives formulated in full as follows:

A. Exploratory and findings values of shop and drawing courses for the detection, discovery, or tryout of interests and aptitudes.

B. Educational guidance as a result of student observation and analysis of numerous vocations by which he finds out what to anticipate in further education and training.

C. Vocational guidance and information gained through the study of various industries by visits, readings, and reports.

D. Consumers' or utilizers' knowledges and appreciations and development of all-round intelligence for things industrial, such as making more intelligent choosers and users of the products of industry.

E. Household mechanics or the development of handyman abilities about the home.

F. Desirable personal and social habits with respect to practical situations, such as neatness, judgement, cooperation, observation, initiative, and responsibility when the social settings of a shop or laboratory offers the opportunity for pupil participation in purposing, planning, doing, and evaluating these practical activities.

G. "Pre"-vocational purposes where the training undertaken is intended to lead up to apprenticeship or further training in a specific vocation.
H. A vocational purpose, or the pursuit of hobbies that relate to shop work and drawing, and making or doing things for oneself or others.

I. A degree of skill with tools and in processes commensurate with the ability of the pupil and incidental to the completion of a project which seems to have educational value.

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J. The seven cardinal principles which seem to summarize the principles of shop work and drawing: (1) worthy use of leisure; (2) worthy membership; (3) command of fundamental processes; (4) citizenship; (5) health; (6) vocation; and (7) ethical character.

K. Mechanical intelligence through experience in hand work where fairly high ideals of skill in use of various tools and materials is the chief emphasis.

L. Correlation with studies intrinsically abstract by providing experiences that will clarify other studies, activities, or interest in or out of school. The following are instances of this principle: members of a Latin class built a model of Caesar's camp; a literature class made a pirate's chest and after secretly burying it up the river, drew an obscure map and challenged another class to find the chest; a third group stated a play; drawing, electricity, and to some extent mathematics and physics were employed in radio construction; and industrial studies involving history, economics, geography, and sociology were pursued.

M. Certain specific faculties such as attention, reasoning, honesty, memory, concentration, and accuracy, developed by making things.

N. Coordination of "hand and eye" by making things.

O. Vocational purposes, definitely preparing for a future industrial occupation.

The jury reaction regarding the ranking of the objective is clearly shown in the following table.
Based upon the foregoing evidence of jury rankings the following aims or objectives seem to be acceptable as of essential importance for industrial arts work at the time of this study.

1. Exploratory or finding values which relate to the detection, discovery, or tryouts of interests and aptitudes.

2. General guidance, both educational vocational, gained through broad contacts and studies of industrial vocations.

3. Household mechanics or the development of handyman abilities about the home.

4. Avocational opportunities for the development of hobbies, or side-line interests.

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5. Formation of desirable personal and social habits and insights which will influence conduct.

6. Consumers' or utilizers' knowledge and appreciation of the products of industry.

7. Development of a degree of skill with tools and in tool or machine processes commensurate with the ability of the pupil and incidental to the completion of a project or activity which seems to have "educational" value.

8. Correlation or integration with other studies and interests both in and out of school.

9. Vocational purposes in the definite preparation for a future industrial vocation. Applicable to from 0 to 16 per cent of the average junior high-school group where the occasional boy has to drop out of school.

Another study of present day industrial arts objectives was made in 1931 by the Industrial Arts Committee of the American Vocational Association. This committee reported that as a part of the general education program it is the special function of the industrial arts to provide experiences which will develop certain traits, habits, and points of view which have been neglected in the other phases of general education.

The desirable objectives as stated in the report are as follows:

1. To develop in each pupil an active interest in

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7 Industrial Arts Report given at the New York Convention of American Vocational Association, 1931.
industrial life and in methods of production.

2. How to select, care for, and use properly the things we buy.

3. The appreciation of good workmanship and good design.

4. Attitude of pride or interest in one's ability to do useful things.

5. To develop a feeling of self-reliance and confidence in one's ability to care for one's self in an unusual situation.

6. The habit of an orderly method of procedure in the performance of any task.

7. A knowledge and understanding of mechanical drawing, and the interpretation of the conventions of drawings and working-diagrams, and the ability to express one's ideas by means of drawing.

8. The development of elementary skills in the use of the more common tools and machines, and in modifying and handling materials in order to make them conform to our needs.

Another study of industrial arts objectives made by John F. Friese8 classifies the aims into the following two groups.

Three Commonly Accepted Manipulative Aims

1. To provide opportunities for boys to make and do things they like to make and do.

2. To provide training in common skills everyone should possess.

3. To provide trade exploratory or try-out experiences

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in typical trades to assist boys in finding and testing their interests and aptitudes.

Five Justifiable and Achievable Non-Manipulative Aims

1. To provide training in industrial art and industrial art appreciation (partially manipulative).

2. To provide a natural medium for guidance, educational and vocational.

3. To provide interesting technical information about the occupation or occupations represented in the school shop and others closely allied.

4. To provide studies in vocational economics closely related to everyday life.

5. To provide organized training in reasoning and problem-solving.

The results of a study on problems of industrial arts objectives carried out at Columbia University by David Sneeden, William E. Warner and others indicate the following range of objectives.

Objectives of the Junior High School Industrial Arts

Primary Controlling Purpose: Developmental experiences through manipulative and other activities introductory to the various accessible phases of the world's industrial work.

Secondary Aims, Objectives, or Values

1. Exploratory or finding studies for the detection of discovery of interests and aptitudes.

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9David Sneeden, William E. Warner and others, Reconstruction of Industrial Arts Courses, Columbia University, 1927, p. 10.
2. General guidance values through broad occupational contacts and studies.

3. Consumer's or utilizers' knowledges and appreciations; the better choice and use of industrial products.

4. Household mechanics or the development of "handyman" abilities.

5. Avocational activities of adolescent youth in the pursuit of hobbies, and in the construction of things to possess either permanently or temporarily.

6. Vocational purposes in the definite preparation for a future occupation (applicable to from 0 to 15 per cent of the average junior high school group).

7. Correlation with other studies and interests both in and out of school.

8. The forming of social habits; development of social values (moral, civic, etc.) possible in every activity of junior high school, but particularly in the industrial arts because of the socialized setting possible.

The objectives of industrial arts work as selected by the Manual Arts Conference and written up by William T. Bawden, Editor of Industrial Education Magazine are as follows:

Objectives of the Industrial Arts Teacher

1. To develop in each pupil an active interest in industry and industrial life, including the methods of production and distribution.

2. To develop in each pupil the ability to select

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wisely, care for, and use properly the things he buys or uses.

3. To develop in each pupil an appreciation of good workmanship and good design.

4. To develop in each pupil an attitude of pride or interest in his ability to do useful things.

5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or unfamiliar situation.

6. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.

7. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.

8. To develop in each pupil the habit of careful thoughtful work without loitering or wasting time (industry).

9. To develop in each child an attitude of readiness to assist others when they need help and to join in group undertakings (cooperation).

10. To develop in each child a thoughtful attitude in the matter of making things easy and pleasant for others.

11. To develop in each pupil a knowledge and understanding of mechanical drawing, the interpretation of the conventions in drawings and working diagrams, and the ability to express ideas by means of drawing.

12. To develop in each pupil 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.
The Indianapolis Public School course of study\textsuperscript{11} for junior high school industrial arts work lists the following general and specific objectives.

**General Objectives**

1. To develop initiative and ability in the expression of ideas of form, color and arrangement.

2. To develop confidence through directed efforts at expression.

3. To improve standards through the understanding of the principles governing structural and applied design.

4. To acquire an appreciation of and a desire for good material and good workmanship.

5. To develop the powers of visualization and invention.

6. To coordinate the mental and muscular powers.

7. To acquire a degree of skill in the manipulation of tools and materials.

8. To realize the necessity for accuracy.

9. To develop an appreciation of the difference and the interrelations of craft and industrial methods of production.

10. To secure a variety of experiences in manipulative crafts thereby acquiring a broader vocational outlook which will help to choose a more purposeful curriculum in the senior high school.

In the preparation of the course of study, an effort...
has been made to outline the work so as to give latitude in the choice of projects in order that the initiative of the teacher and the individuality of the pupil may be developed. Certain restrictions have also been set up to limit the endeavors to the abilities of the pupils and to keep the work within the scope of time, equipment, and material available.

The specific objectives for the various units of work taught in the junior high classes are listed below.

Concrete

Specific Objectives

Since concrete is becoming more and more popular as one of the modern construction materials, this short course is designed to give pupils, through experiments on small objects, an insight into the various mixtures and ingredients of concrete, and the methods of curing, bleaching, coloring, waterproofing, and reinforcing concrete.

Electricity

Specific Objectives

1. To give pupils through talks and demonstrations, a general idea of the behavior of electricity and to acquaint them with its important place in the world today.

2. To enable the pupil, through experimental work, to have some knowledge of electric circuits and electrical equipment and devices.
3. To enable pupils to have some knowledge of various effects of electricity—magnetic, heat chemical, and shock.

Home Mechanics

Specific Objectives

1. To instill in the lives of the boys an interest in their homes and a desire to keep the things around the home in excellent repair.

2. To teach the pupils how to repair or replace broken or worn out parts of things around the home instead of employing a professional to do the work.

Mechanical Drawing

Specific Objectives

1. To teach the universal language of industry through:
   (a) The making of drawings and sketches
   (b) The reading of drawings and sketches

2. To emphasize accuracy and neatness commensurate with the pupils ability.

3. To develop the power to visualize objects.

4. To teach the advantages of "planning and doing."

Metal Work

Specific Objectives

1. To acquaint pupils with the possibilities and behavior of metal because it has become so widely used in all kinds of construction work.

2. To permit pupils, through experimentation, to acquire some knowledge of the fundamental operations used in metal construction.
Printing

Specific Objectives

1. To enable the student, through practical work, to have a knowledge of printing materials and operations.

2. To acquaint the student with the possibilities of printing and to give him an understanding as to how a complete job of printing is produced.

3. To acquaint the student with the artistic values of the printed page with such trade practices as will give him pre-vocational information.

Woodworking

Specific Objectives

1. To develop in pupils a liking for wood and things constructed of wood. To teach the appreciation of good workmanship and the selection of appropriate finishes.

2. To know and appreciate good tools; to develop accuracy in their use.

The work in the shop classes shows a strong tendency toward laboratory or activity types of learning, general in character. More emphasis is placed upon related scientific knowledge and social habits rather than upon manual and mechanical skills. An appreciative understanding of industrial life is interwoven in the daily work. Teachers are professionally trained for their work rather than coming from the trades with little college training.

Pupils projects are selected on the basis of a felt need on the part of the pupil. Many kinds of material are used. Most projects have a practical value in the home.
The material presented in this study shows that a system of manual training, as outlined by the original leaders of this movement, should at every step hold fast to the object of education as a whole, laying stress upon such objectives as have been recorded in Chapter III of this study.

The source material shows that the original leaders failed to agree upon any one or combination of objectives; yet, it is significant, that all objectives mentioned are based on broad general educational values.

We therefore conclude that the original claims set forth in behalf of manual training were based, not on economic reasons, such as specific trade instruction, but on broad general educational objectives, and it was because of the acceptance of these values by educators that the new form of instruction was so speedily and generally accepted.

It is also concluded that the material in Chapter IV of this study establishes the fact that although the present day objectives of industrial arts have been greatly revised and broadened the major aim of the work is still in harmony
with the general educational aims set forth by the original leaders of the manual training movement.

We therefore conclude that the original and present day aims of manual training are based, not on economic reasons, such as specific trade instruction, but on broad general educational objectives. Accordingly, in the formation of future educational programs, this work must be recognized as a spoke in the great wheel of general education.
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The purpose of this paper is to advance the claim that tool-instruction, work-shop lessons, -- in a word manual training, -- are essential elements of general culture.


A general survey of the origin and development of industrial education in Europe with incidental accounts of the influence of certain European movements in America. A sketch of the history of industrial education in United States. Discussions regarding the introduction of educational hand work in the schools.


Digest of a research on terms used in Practical and Vocational Education.


This book deals briefly and adequately with the philosophy and place of industrial arts in the present-day education. Separate chapters deal with trends, objectives, methods and administrative problems in industrial arts education.


This volume covers the early development of industrial work up to the year 1870. Perhaps the most complete on record. Its aim has been to set forth the most significant types of work wherever
found, and especially those that have exerted the widest influence.


In this volume, an effort has been made to give facts and opinions of men of recognized standing which go to make up the history of the subject. No effort is made to uphold any particular theory. The reader is left to draw his own conclusions.


This article traces the early use of this term and makes comparisons with the work that is now known as Industrial Arts and Manual Arts. The writer shows that in general the content and methods used in all three types of work are the same.


An examination of the old system of apprenticeship that formerly provided broad training for the young workers of this country. Also makes an attempt to prove that the industrial education in its present form fails to provide the broad knowledge of industries and occupations necessary to the education of youth.


A survey of the movements in educational handwork. Also methods of teaching industrial arts and its appreciation.

Journal of the Proceedings and Addresses of the National Education Association, Vols. 1920-1921.


An article discussing the wide difference that exists among industrial arts teachers regarding lack of uniformity in aims and standards.
BIBLIOGRAPHY (CONTINUED)

Suggests program to sift out the accumulated mass of data as a start toward something resembling a standard which can be urged as being fit for use, and containing the most potential educational efficiency.

A paper showing that this art is an inseparable part of life and an essential of daily life and happiness. Therefore it should occupy an important place in our educational structure.

A study of the treatment given to subject-matter in professional schools devoted to the education of teachers. The following question is discussed. Should teachers' courses in a specified subject-matter be given a treatment that will differentiate them in a thoroughgoing way from liberal arts courses in the same field? And if they should be, what are the means to such differentiation?

Part I. The school and industrial life. A study of industries for the sake of a better perspective on man's achievements in controlling the production, distribution, and consumption of the things which constitute his material wealth.
Part II. Fundamental values in industrial education. An effort to show that industrial arts, rightly interpreted, has a right to a place in the school curriculum on a basis of thorough respectability and validity. Also a discussion of the liberal and social elements of the work.

A paper showing the various aims and types of industrial education and why the work is helpful and needed by every youth in the country.
BIBLIOGRAPHY (CONTINUED)


The discussion of various industrial arts theories, methods of instruction, and organization, courses of study, time allotments and types of product which have arisen in the United States since 1871. Treated from the secondary education level only.


Shows the many changes through which Industrial Arts has passed which resulted in confusion of terminology on the subject. Also claim that, although terms and methods have made many changes the basic aims of the work remain the same.


This is a study to determine the policies which relate to the preparation of industrial arts teachers, and attempts to formulate a program on these policies.


A study of the specific values or things of worth sought or expected to be achieved through industrial arts education. Also a study of the types of school personnel in whom such values are expected to be realized.


Report contains opinions of leaders in manual training regarding terminology, classification and practical details regarding manual education. Practical details include sizes of classes, length of periods and age levels where different work shall be introduced.

This report shows that while manual training does not train for specific trades, it does give an all-round mechanical education which would greatly increase the industrial efficiency of all the boys taking it.

Woodward, C. M. *Manual Training in Education*. New York: An effort on the part of the author to show that the aims of manual training are not specialized training or confined to any single objective but rather that the work must have as its aim the general education of the pupil.