A HISTORY OF INDUSTRIAL ARTS

FROM 1920 TO 1964

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

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* * * * * *

The Ohio State University
1964

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ACKNOWLEDGMENTS

The compilation of a history of a discipline is not an undertaking which can be adequately completed without the assistance of many individuals and organizations. The author humbly wishes to thank the many who have contributed material used in this work. To credit each contributor individually would be a pragmatical impossibility. However, the author does hereby wish to acknowledge those individuals and organizations whose contributions are not apparent from the footnotes and bibliography.

Sincere recognition is given to Mrs. Elizabeth Horton of the American Vocational Association for making available many association documents; to Mr. Kenneth Dawson and Mr. Jack Simich of the American Industrial Arts Association, especially for their assistance in providing a comprehensive history of the organization; to Dr. Earl Weber, Editor of The Industrial Arts Teacher, for making available the historical volumes of the representative publication of the American Industrial Arts Association; and to the Charles A. Bennett Company, Inc., the International Textbook Company, and the McKnight and McKnight Publishing Company for permission to quote extensive passages from their works.
The author sincerely appreciates the assistance and guidance given him by his committee members, Dr. Robert W. Haws, chairman and major adviser, Dr. Everett J. Kircher, Dr. Robert M. Reese, and Mrs. Melba E. Griffin, Ph. D., Counselor of the Graduate School. A final but immeasurable gratitude is extended to my wife, Muriel, for her many hours of assistance in the preparation of the final copy.
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CHAPTER I

NATURE OF THE DISSERTATION

The history of American industry has been voluminously recorded and interpreted. Numerous publications elaborately follow and describe the technological progress which has made America the power it is today. Unfortunately, this cannot be said of industrial arts, that area of general education which professes to transmit to each student the industrial position of the period.

The early evolution of industrial arts has been diligently presented and interpreted in historical volumes. Works such as History of Manual and Industrial Education up to 1870 and History of Manual and Industrial Education 1870 to 1917 by Bennett, History of Manual and Industrial School Education by Anderson, Art and Industry. Education in the Industrial and Fine Arts in the United States by Clarke, The Determining Factors in the Evolution of Industrial Arts in America by Mays, and The Manual Training School by Woodward have amply developed the origins of manipulative activity in formal education. However, since the 1920's compiled historical material showing the development of industrial arts is not available.

It is the purpose of this study to uncover and organize material

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relating to the recent history of industrial arts, specifically, from
1920 to the present.

The Problem

The major problem under investigation requires the formulation of an objective record of growth and progress of industrial arts from 1920 to the present. Involved in this major problem are the following three sub-problems:

1. Identifying the influential individuals associated with specific movements important to industrial arts.

2. Identifying the major trends and movements in industrial arts during the period.

3. Examining the work of leading formal organizations in industrial arts of the period and showing the contributions and influences these organizations have had upon industrial arts.

Assumptions

In undertaking this study, certain assumptions have been made. These assumptions are:

1. While no formal history of industrial arts for the period 1920 to the present exists, it is assumed that such a history
may be developed using approved research techniques.

2. The professional journals devoted to any profession should contain a representative picture of the profession for the period.

3. The publications and records of national professional organizations should reveal information pertinent to the identification and evaluation of leaders, trends, and influential groups within the profession.

4. Textbooks pertinent to the problem at hand should reveal information important to the development of a history of industrial arts.

Limitations of the Study

Due to the comprehensive nature of an historical research, the author is limiting this study to a review of the following sources.

1. Periodicals
   a) American Vocational Journal
   b) Industrial Arts Teacher
   c) Industrial Arts and Vocational Education
   d) Industrial Education Magazine
   e) School Shop
2. Published materials, and minutes if necessary, representing the following organizations
   a) American Industrial Arts Association
   b) Epsilon Pi Tau
   c) Industrial Arts Division, American Vocational Association

3. Pertinent texts

Terminology

Terminology has played a controversial role in the history of industrial arts. For this reason the definitions of pertinent terms used in the study will be stated. It should be noted, however, that many of the following terms were used interchangeably to identify the same curriculum area; in the following text the name used to identify industrial arts is generally the one which was popular during the period being investigated.

General Industrial Education. Identifies the industrial education subjects having general education objectives.

General Education. That part of an individual's liberal education which is obtained as a result of scholastic experience.

Industrial Arts. That area of general education which studies the "changes made by man in the forms of materials to increase their
values, and of the problems of life related to those changes."¹ Its supporters stress the development of the individual so that he will be able to understand the contemporary technological society as opposed to placing stress upon the development of specific skills or the making of specific objects. It is the term presently used to describe shop activities in general education using natural and man-made materials.

**Industrial Arts Education.** Used synonymously with the term **Industrial Arts.**

**Industrial Education.** This is "a broad term which includes all educational activities dealing with modern industry."²

**Liberal Education.** The total non-vocational education of an individual. Liberal education is not limited to scholastic experiences but includes all learning experiences occurring in an individual's lifetime.

**Manual Arts.** That area of general education stressing manipulative activities with industrial materials. This subject stresses


the development of creative abilities within the student. It emphasizes
craft abilities as opposed to the development of machine tool skills.
Its original supporters were actually in rebellion against the methods
and specific objectives of manual training.

Manual Training. That area of general education stressing
manipulative activities with industrial materials. Manual training is
characterized by teacher-directed activities and stresses the pro-
gressive development of such skills as a form of general education.

Manual Training Subjects. A term used to identify the gen-
eral industrial education subjects which existed from approximately
1890 to 1930. The term simultaneously identifies manual training,
manual arts, and industrial arts during a period when these terms
were used interchangeably in referring to industrial education sub-
jects with general education objectives.

Prevocational Education. That education which enables stu-
dents to discover for which one, if any, of several vocations they
are "best fitted by natural ability and disposition. . . ." The instruc-
tion for this purpose is primarily based "upon actual participation on
the part of the learner in a variety of typical experiences derived
from the occupations involved."\(^3\)

\(^3\)Arthur F. Payne, Methods of Teaching Industrial Subjects
Practical Education. A comprehensive term which includes all general education subjects which are "concerned with such physical work as is done in the home, industry, agriculture, business and the arts."4

Sloyd System. "... a system of Educational Handwork... [embracing] many useful forms of handcraft." Its purpose was of a general education nature in that the sloyd system attempted to cultivate "manual dexterity, self-reliance, accuracy, carefulness, patience, perseverance, and especially does it train the faculty of attention and develop the powers of concentration."5

Vocational Education. Education whose "controlling purpose ... is to fit persons for useful employment." Vocational education "does not take the place of general... education: It supplements and enhances it for students who want training for a chosen occupation."6

4Giachino and Gallington, p. 13.


CHAPTER II

EVOLUTION OF INDUSTRIAL ARTS TO 1920

It has been said that the study of industrial arts is nearly as old as man. Unfortunately, as will be evidenced in subsequent pages, this statement will never receive wholehearted acceptance or rejection due to the uncertainty, on the part of both educators and laymen, related to the definition, objectives, content, and methods of teaching the subject. Whether one subscribes to or refutes this early origin of industrial arts, the earliest of documents reveal that some form of industrial education has existed since man played a part in shaping his destiny.

There is strong evidence that from the dawn of history there have been two separate and distinct kinds of education. Anderson describes these as

\[\dot{\ldots}\text{the education of the laborer through practice with tools, implements, and machines in shop, field, ship, or mine, and the education of brainworkers and members of the leisure class in the school, largely with the aid of books.}\]

Most of the conflict regarding industrial arts and its place in the

educational curriculum arises from efforts of educators and philosophers to prevent the merging of these two types of education.

Early Beginnings In Industrial Education

The education of man before the discovery of fire was generally a method of learning by imitation of the leader of a group. In extremely primitive groups the leader was usually the father of the family. As man learned to use more of the natural resources which surrounded him and as he learned to change the form of the resources he readily could not use, a division of labor within groups began to appear. Within a society, however small, individuals found that they could raise their own standard of living while contributing to the community needs by doing what they could do best for not only themselves, but for others. Thus, as the trading of products, services and skills evolved, it became increasingly important for individuals to develop their abilities in a specific area. This development grew through a process of conscious imitation, a teaching of routine, not theory.

The Manual Arts in Ancient Civilizations. As men developed their society, some realized that the necessity of learning a skill was tantamount to existence itself. One of the earliest people to recognize the necessity and importance of a trade was the ancient Jews. Manual labor in their society was often equivalent
to prayer. However, even in that ancient period, manual work was not recognized as an invaluable necessity by all people. The Greeks during the height of their civilization looked upon handwork with contempt. Socrates gave definite reasons for condemning "banausic work," work which was merely mechanical and which ruined the bodies of all people involved in it.

Socrates represented the views of the upper classes, views which did not prevent the refinement of hand skill among the working classes. The very banausic arts which were looked down upon by the rich were basic to the development of Greece and Rome. Apprenticeship training, developed earlier, continued to cultivate many arts and produced the workers so necessary to any civilization.

**Monastic and Guild Societies.** Although the Greek and Roman civilizations lost the political power they so violently fought for, their artistic and industrial skills survived. Basically responsible for this persistence during the Middle Ages were the monastic societies where handwork played a very important role in the daily way of life.

Education outside of the monastaries during the Middle Ages was basically achieved through participation in skilled labor groups called guilds. For the middle-class youth, apprenticeship became the dominant educational institution. Under the apprentice-
ship system a boy would live with a guild member for the specific purpose of learning an occupation. After completing his training and a period of "journeying," the student was ready to assume his own responsibility in the guild.

Evolution of Handwork as a Form of General Education

There appeared during the fifteenth century three events which were to have a profound effect on education; these were the invention and early development of the art of printing, the Renaissance, and the Protestant Reformation. During this period two fundamental concepts appeared upon which further instruction in manual arts was based. The first was that sense impressions are the basis of thought and, consequently, of knowledge. The second was the related idea of learning by doing.

Renaissance. Some historians feel that the beginning of modern industrial education is found in the Renaissance. As a period of rebirth, the Renaissance brought the revival of town life which had existed during the Greek and Roman civilizations but which had been replaced by agrarian civilizations during the Middle Ages. As towns grew at convenient and tactical locations, the common people's ways of life changed. Where towns had been established, merchants, craftsmen and laborers were brought together.
Three Stages of Industrial Education. Anderson feels that the manual and industrial education movement may be recognized in three distinct stages. The first stage, taking place during the Renaissance, theorized the beginnings of a "systematic education in agriculture, carpentry, and other forms of manual industry."²

One of the earliest advocates of educational reforms in this period was Martin Luther, who looked upon existing education in a monastery as a binding, stunting, narrow type of life. While feeling that many of the subjects studied were of great importance, he felt that the placement of a boy in a monastery for an education was an "absolute injury to the young; for they stand in quite as much need of pleasure and recreation as of eating and drinking."³ Luther advocated educational reform through state-controlled learning for all people and further proposed a school day of two hours, leaving the rest of the day for the learning of a trade at home. He strongly stressed the importance of learning a trade in addition to attending formal classes and felt that "these two occupations (should) . . . march side by side."⁴ His objective for industrial education was clearly a vocational one.

²Ibid., p. 5.


However, not all philosophers and educators in the fifteenth century saw educational handwork as a vocational subject. Anderson points out that in More's *Utopia*, in Rabelais' *Utopia*, and in Campanella's *City of the Sun*, part of the general education of the inhabitants consisted of studying certain industrial occupations and manufacturing processes.⁵ Campanella, in his *City of the Sun*, devotes one city wall to

... instruction of the inhabitants in the various arts and industries. Furthermore, the ablest artisans are assigned to the task of instructing the citizens in the handicrafts.

The city is divided by its walls into seven concentric circles. The wall surface is utilized for purposes of public instruction. The course of study is decidedly realistic. Things and not words are studied. Each wall is covered with pictures or specimens or diagrams relating to some one field of learning, such as mathematics, geography, zoology, etc. The sixth wall is assigned to industries. On it are represented all the mechanical arts, with the several instruments for each... Regular instruction is supplemented by visits to workshops.⁶

In Campanella's city the highest citizen rank was bestowed on the individual who practiced the industrial arts most successfully.

The second stage of the industrial education movement began in the seventeenth century and was characterized by action on the part of the "progressive and original thinkers" of the time.

⁵Anderson, p. 6.

⁶Ibid., pp. 3 and 10.
to develop courses offering both "general and industrial edu-
cation." It was during this period that industry was acknowledged
as a reality and that a knowledge of this reality was extremely im-
portant to educated individuals of the time.

It is at this time that the philosophical writings of Francis
Bacon influenced educational thinking. Though not concerned with
the education of the masses, Bacon's philosophy of realism was
reflected later in the work of such men as Petty, Dury, and
Cowley. Bacon believed that not all learning was to come from
books, that not all "wisdom had been revealed to man." He wrote:

Be not wrapped up in the past, there is an actual
present lying all about you; look up and behold it in its
grandeur. Turn away from the broken cisterns of
traditional science, and quaff the pure waters that flow
sparkling and fresh forever from the unfathomable
fountain of creation. Go to nature and listen to her
many voices, consider her ways and learn her doings;
so shall you bend her to your will. For knowledge is
power. 8

Anderson writes of the period:

It is the period in which Petty plans the "Literary
Workshop," so similar to the modern industrial high
school. It is the period of Cowley's trade school, of
Morhof's Scholae Naturae, Artis et Actionum Humanarum,

7Ibid., p. 5.

8Bennett, p. 35.
of Becher's mechanical or trade school, of Descartes' technical school for workingmen, and of Comenius' vernacular and Latin schools, in both of which instruction in the industries was to be given. 9

One of the notable writers on education in the seventeenth century was John Comenius. In his famous work, Great Didactic, Comenius proposed the study of the "mechanical arts" for more than just vocational purposes. He felt that:

Children are to study the industries in part "that they may not be too ignorant of what goes on in the world about them." . . . The principles of the mechanic arts should be studied in order that "any special inclination towards things of this kind may assert itself with greater ease later on." Moreover, industrial occupations contribute to the maintenance of health. . . and cultivate the habits of industry and love of work. 10

Payne writes that Comenius had . . . the idea of try-out courses, self-discovery, and vocational guidance. He [Comenius] says that "boys would discover their special aptitudes if in addition to academic subjects they were given instruction in the mechanic arts." 11

Comenius believed in education through the senses; he strongly felt that one could not learn solely through the use of books.

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9 Anderson, p. 5.

10 Ibid., pp. 15-16.

11 Payne, p. 5.
To this end he developed nine methodological principles of which the following related directly to educational handwork:

Whatever is to be known must be taught (that is, by presenting the object or the idea directly to the child, not merely through its form or symbol).

Whatever is taught should be taught as being of practical application in everyday life and of some definite use.

Whatever is taught must be taught with reference to its true nature and its origin; that is to say, through its causes.

Stress should be laid on the differences which exist between things, in order that what knowledge of them is acquired may be clear and distinct.\(^{12}\)

Comenius proposed realistic educational programs including the study of industry. He believed that training in mechanics had to include manipulation, be it in the form of simple movement of materials or in the construction or destruction of objects. He believed that the degree of difficulty of these manipulations was to be determined in part by the natural desire of children and that the manipulative activities should involve

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things children of a certain age like and want to do. Comenius believed that children should play, and in play they should imitate the handicrafts.

Some years later Comenius' ideas on education became known in England, specifically to Samuel Hartlib, a philanthropic businessman who was actively promoting social and educational reforms of the period. Hartlib, a student of Comenius' writings and ideas, worked with John Dury, a Puritan preacher, John Milton, and John Evelyn, writer on forestry and gardening and the secretary of the Royal Society, and established a school for boys which incorporated many of Comenius' ideas on industrial education. The one common theme of these men was an education which would invite students to study because of its pleasant approach and, at the same time, would enable the student to learn useful material.

The seventeenth century produced other leaders who were most favorably inclined toward instructional handwork, both for the youth and the adult populations. Such men as Descartes, Leibnitz, and Locke promoted industrial education enthusiastically. Anderson quotes Baillet's biography of Descartes which proclaims Descartes to be

...the first to conceive the idea of opening public courses of instruction for workingmen. According to
his plan, large halls were to be erected for the different crafts. . . . For each of these institutions there was to be appointed a competent instructor, capable of answering the workingmen's questions and of giving them such instructions as would enable them to give a reason for each of the operations which they were daily called upon to put into practice.

Leibnitz proposed a school for boys "who are not fitted by nature for those intellectual pursuits to which regular schools devoted exclusive attention."\textsuperscript{14} His plan is one of the earliest on record for the establishment of an industrial school for mentally retarded children.

However frequent were proposals in the seventeenth century to include handwork in the school curriculums, it was not until the beginning of the eighteenth century that such work was seriously introduced into the schools. It appears that two educational reformers, August Hermann Franke and Christopher Semler, clergymen from Halle, Germany, almost simultaneously introduced educational programs stressing handwork. Franke's program was instituted in the Pedagogium Regium, a school for the youth of the aristocratic class and included "tool and shopwork" in addition to excursions to workshops and factories. Although this program was not a compulsory part of a student's education, it was generally

\textsuperscript{13} Anderson, p. 18.

\textsuperscript{14} Ibid., p. 19.
engaged in by most students since it was the "popular" thing to do. Besides having educational value, it was felt that handwork was a fine means for healthful exercise. Franke's philosophy reflected the influence of Comenius in that Franke believed the study of the industries was not only for recreation and exercise but also to "lead the pupil to form correct ideas of all things pertaining to the common weal and to learn their names both in German and Latin."^{15}

While Franke's program of industrial study was introduced into the general school curriculum, Semler's program was prepared to satisfy the needs of the youth of the working class. Semler's school by today's standards would seem to have been vocational in nature.

The eighteenth century found the desire for industrial education increasing. Anderson writes of numerous pamphlets published on the subject in the early seventeen-hundreds. The literature seems to reflect the need for industrial education on two levels: first, the study of industrial subjects as part of general education and, second, the study of industrial subjects in order to secure trade proficiency. Perhaps it is at this point in history that the confusion between what are presently called industrial arts and vocational education earnestly begins.

^{15}Ibid., p. 35.
One of the individuals most influential in the industrial education movement of the eighteenth century was Rousseau. Through his famous work *Emile*, he vigorously promoted the idea of industrial education as an important part of general education. Rousseau, strongly opposing the traditional educators of the period, firmly believed that the educative process could not be confined to the use of books and felt that real experiences were the core of childhood learning and development. In his chapter "The Approach of Adolescence," Rousseau advises:

... show him [the youth] the mutual dependence of men, ... and direct his attention to industry and the mechanical arts which make them useful to each other.

Reader, do not give too much thought to the bodily activity and the skill of hand of our pupil. Consider rather the direction we are giving to his childish curiosities. Consider his senses, his inventive mind, his foresight. Consider the good head he will have. He will want to know all about everything he sees and does, and will take nothing for granted.16

Rousseau not only believed in student activity in one workshop but advocated the field-trip activity stressed by some industrial arts educators today. But Rousseau went one step beyond mere observation in such study. He writes of such trips:

As you take him from one workshop to another, never let him see any kind of work without putting his hand to it, and never let him leave till he knows perfectly the reason for all that he has observed.\textsuperscript{17}

The effect of the educational writers of the seventeenth and eighteenth centuries was profound on the philanthropists of the period. Historians write of the contributions of such men as Basedow, Salzmann, Campe, Blashe, and Heusinger, all of whom stressed the application of naturalistic principles to general education.

\textbf{Industrial Revolution.} The period from approximately 1750 to 1850 was an epoch during which exceptional technological changes which were to have a profound influence on the future concept of industrial education occurred. Known as the Industrial Revolution, this period nurtured developments which radically changed the entire pattern of civilization. The Industrial Revolution was a period of transition, beginning in England and later spreading to the European continent, from the agricultural and cottage industry period to the industrial era. Where formerly manufactured goods were chiefly made by individuals in the home, the advance of the factory system revolutionized existing methods of manufacture; workers decreasingly labored in their homes and tended instead to

\textsuperscript{17}Ibid., p. 86.
work in the factory. This grouping of workers was largely responsible for the growth of large towns and cities, for now the workers had to live near their places of employment.

Influence of Pestalozzi. During the latter part of the eighteenth century and the early part of the nineteenth century, the educational theories and experiments of Pestalozzi and von Fellenberg were influential in the "implementation of the concept of work as education." Stimulated by the writings of Rousseau, Pestalozzi organized one of the first industrial schools for the children of the poor in 1775. In this school the following were some of the major principles used:

Observation, or sense perception (intuition), is the basis of instruction. In any branch, teaching should begin with the simple elements and proceed gradually according to the development of the child, that is, in psychologically connected order. Instruction should be subordinate to the higher aim of education.

The underlying philosophy in Pestalozzi's program was one of learning through manipulative and real experiences. Because of the implementation of earlier ideas regarding the inclusion of manual experiences in educational situations, Pestalozzi is sometimes called the father of manual training and modern elementary


education.

Another influential educator of the period was Froebel, a disciple of Pestalozzi. Perhaps best known for his promotion of the kindergarten in 1837, he believed that the study of the industrial arts was an important part of general education. Froebel felt that the activities promoted in the classroom should be the result of student interest; he believed that each child was an individual and, as a result, that each student had individual interests and capabilities.²⁰

**Russian System of Education.** A study of the trades in a formal system of public education began during the latter stages of the Industrial Revolution; in the year 1830 the School of Trades and Industries was established in Moscow. The school was considered revolutionary because it utilized the class type of education as opposed to the individual or apprentice method.

In 1867 a French engineer, A. Cler, developed what was perhaps "the first analysis of tools, materials, processes, and the content of industrial education for the purpose of teaching."²¹ Cler, however, was interested in the formal study of the industrial materials and processes of the time; and seemed little interested

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²⁰ Payne, p. 9.

in the student as an individual. His approach to the study of his subject was logical and methodical, and his lessons presented a logical sequence of knowledge and manipulative activities.

One year later, Victor Della Vos, who was then director of the former School of Trades and Industries, then known as the Imperial Technical School, adopted Cler's approach to the study of industry. Following Cler's methods, Della Vos established a curriculum based on a progression of increasingly difficult exercises. This program was very definitely vocational in nature but was to be reflected in the manual training programs to be established in the United States shortly afterward.

Sloyd System of Education. Another movement featuring educational handwork originated during the early part of the 19th century; the sloyd system, beginning in Germany, soon spread through the northern countries of Europe such as Finland and Sweden. In these countries the children of the family were taught various trades and skills, in the home by their parents, usually pertaining to the fabrication of wood. The values of such a program of instruction were recognized by Otto Salomon, who at the request of his uncle, August Abrahamson, came to Naas, Sweden, to organize and teach a program of educational sloyd to the children on Abrahamson's estate. Otto Salomon, who studied at the Technical
School of Stockholm and the Ultuna Agricultural Institute, enthusiastically devoted his time to this new idea of education and wrote in his book, *Theory of Educational Sloyd*, of work in such areas as carpentry, carving, smith's work, basket making, stone cutting, and printing. In 1874 he started a similar school for girls in which subjects such as weaving, sewing, and domestic economy were taught. Eventually, the popularity of the sloyd system became such that Salomon established the system formally known as Educational Sloyd.

The educational sloyd as developed by Salomon had three major characteristics: (1) making useful objects, (2) analysis of processes, (3) educational method. Perhaps Dr. Alvin, a one-time director of the School for Training Teachers of Handwork, in Leipsic, Germany, best describes the sloyd system of education in the following:

The word "sloyd" means general skillfulness in the way of a trade. . . . However, the purpose of sloyd is never the industrial training, but always the development of the physical, spiritual, and moral powers of the child. Sloyd acts in an educative way; it calls into play independence, accuracy, diligence, and perseverance, upon

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which the character of the individual rests, and leads to respect for work, especially physical work.²³

European Influences on American Education

The European philosophies promoting the inclusion of handwork and the study of industry in school curriculums soon spread to other continents. In the seventeenth century the United States as a country was still in its embryonic stage, strongly susceptible to European thought; it was a country whose people faced the realistic hardships of an undeveloped land and in turn looked for realistic approaches to daily problems. It was at this early stage in America's development that notions and ideas regarding educational handwork filtered across the Atlantic to find a mixed reception among the early settlers in the colonies. But whatever the initial reaction of the colonists was, it was not long before educational programs designed for the people of the New World evolved from the leaders settled there.

Early Experiments with Educational Handwork. One of the most progressive proposals for educational handwork was introduced in 1685 by Thomas Budd, a former Englishman. He urged that

public education not only be made free to all who wanted it but that public education be made mandatory for all children, including the children of the Indians. In his treatise, Good Order Established in Pennsylvania and New Jersey in America, he suggested a law which would make certain that all children of New Jersey and Pennsylvania attend school for at least seven years. He urged that each town and city should have a school staffed with persons "of known honesty, skill and understanding" who would teach boys and girls in all the most useful arts and sciences. 24 Each boy was to learn a trade, while every girl would receive instruction in such household duties as spinning, knitting, sewing and needlework.

As the population of the United States increased and masses of people trekked westward in search of new homes, the need for vocational education took on greater importance. By the nineteenth century the desire for some form of vocational or mechanical preparation was such that a French statesman and economist, DuPont, was commissioned by Jefferson to propose a plan of education for the American people. DuPont included the mechanic arts 25 in his plan and wrote of the subject:

24 Bennett, History... up to 1870, p. 63.

25 The term mechanic arts appears here to be used to identify the arts of mechanical theory and construction.
In America where country dwellings are isolated, it is important that the principles of mechanic arts should be widely taught, and that each family should have at least one well-informed member; for a trained mechanic is not always within reach.  

The decades of the 1830's and the 1840's brought an increasing number of school programs which included the study of the mechanical arts. While some of these curriculums were designed to prepare mechanics and to educate farmers in the ways of the mechanic arts, other curriculums were designed to serve as general education subjects.

In 1860 Sheldon, the Superintendent of Public Schools at Oswego, heard of Pestalozzi's work in Europe and imported some of his followers to train the Oswego teachers according to Pestalozzi's methods. Sheldon's Normal School (now the State University College of Education at Oswego, New York) used an experimental school to prepare educators where the principle of learning by doing was paramount in the program. The program evolved so successfully that it became known as the Oswego Movement. Educators from all over America as well as Europe came to observe its operation.

By the last quarter of the nineteenth century, there was still stronger support for the inclusion of manual subjects in the

school programs. Influential industrial and commercial groups set upon the task of assuring themselves of an educated labor force by having industrial subjects taught to the school youth. However, there was one major barrier to the introduction of industrial classes on a large scale; this barrier was one of economics. While many men of the period felt that industrial study was necessary, none could offer a plan which would finance such ventures in school systems. Thus the stage was set for the now famous Philadelphia Centennial Exposition of 1876.

**Russian System Implemented in America.** In 1876 there appeared in Philadelphia an exhibit which was to have a profound effect on the teaching of industrial subjects in the United States. It was here that the Russian system of technical education, then flourishing at the Imperial Technical School at Moscow, was officially introduced. At this exposition Dr. John D. Runkle, then president of the Massachusetts Institute of Technology, was highly impressed with the Russian system of education and immediately set upon the task of organizing a similar program for his students. Dr. Runkle saw in the Russian system a method to study the industries of the time as chemistry, physics, and other scientific subjects were studied. As Runkle stated:
My first work was to build up at the Institution a series of Mechanic Art shops, or laboratories, to teach these arts, just as we teach chemistry and physics by the same means. At the same time I believed that this discipline could be made a part of general education, just as we make the sciences available for the same end through laboratory instruction. 27

Dr. Calvin M. Woodward of Washington University in St. Louis was another American educator who witnessed the Russian system of technical education in Philadelphia. Like Runkle, Woodward was favorably impressed, but he saw in the system a method of offering the study of the mechanic arts as a general education subject to students on the secondary level. In 1878, Dr. Woodward presented a paper on his ideas before the St. Louis Social Science Association. Calling the subject manual training, he advocated its disciplined teaching to secondary school youth as a general education subject. In 1880 with the financial support of some St. Louis businessmen, Woodward opened the Manual Training School of Washington University with an enrollment of approximately fifty students; this occasion is regarded by many educators as the beginning of industrial arts in the United States.

Dr. Woodward felt that the manual training high school was

... neither a technical school nor an industrial school. ...
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 only small parts of even a trade. Neither is there any thought of manufacture with a view to selling something which will yield an income. The object of every feature is education in a broad and high sense. 28

It can be plainly seen from Woodward's statement that his purpose of mechanical study was to develop an individual in the liberal sense. However, the graded disciplined exercises were later to be considered a way of teaching vocational subjects.

The success of Woodward's manual training high school led to the establishment of additional manual training schools. However, as with the establishment of the Manual Training School of Washington University, all schools were sponsored with private funds; it was generally the businessman who felt that a knowledge of industrial processes was important for all individuals. It was not until 1884 that the first manual training school supported by public funds was established in Baltimore, Maryland.

**Sloyd System Achieves Recognition.** It is at this point that American interest in another European system of industrial education, the sloyd system, was stimulated. The original sloyd system was given great impetus by the Finnish reformer, Cygnæus. The son of a clergyman, Cygnæus recognized this method of hand

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28 Ibid., p. 15.
instruction as a means to economic ends while simultaneously acquiring a general education.

The popularity of the sloyd system of educational handwork spread to many countries. By the end of the eighties, the system was established in the United States. One of the leading champions of the sloyd system in America was Gustaf Larsson, a former student of Salomon. He was director of one of the earliest sloyd schools founded in America, the Sloyd Training School of Boston, established in 1888.

Although Larsson is mentioned most frequently in connection with sloyd in America, another form of the sloyd system was introduced into the United States in the late 1880's by Lars Eriksson. John Ordway, a professor at the time in the Institute of Technology at Boston, was interested in Eriksson's method of teaching after reading a paper on the subject titled "Slojdaren." At Ordway's request, Eriksson came to America and began teaching his system of sloyd in Boston where the Naas system was already established. 29 The differences between the two systems were basically confined to the use of drawings versus the use of models and specific exercises.

to meet the objectives of the sloyd system.

**Arts and Crafts Movement Influences American Education.**

However popular the sloyd system became, it was still not without its critics. Some educators felt that the sloyd system did not in reality overcome the major defects of the Russian system of industrial education. They pointed to the fact that the making of useful objects did not necessarily arouse the interest of students any more than the Russian manual exercises if the student himself did not have immediate use for the object. Critics also felt that the sloyd system stressed conformity and prevented any self-expression on the part of the student; another criticism was the accent on the perfection of hand skills.

Resulting from the inability of the sloyd system to meet the needs of all students, still another system of educational handwork achieved prominence in the American schools. Originally exhibited at the Philadelphia Centennial Exposition but not heralded by educators of the time, the display consisted of samples of "arts and crafts work based on the principles of William Morris and the 'Pre-Raphaelite Brotherhood.""^30

The arts and crafts exhibit at the Philadelphia Exposition

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^30 Payne, p. 12.
was the result of a movement, beginning in England during the middle of the nineteenth century, intended to preserve the handcrafts in the face of the industrialization which the onset of the Industrial Revolution had brought about. Arising from the discourses of Carlyle, the arts and crafts movement was developed through the efforts of John Ruskin and William Morris, among others. Charles Leland was one of the prominent Americans responsible for the inception of this system into the American schools.

The outstanding feature of the system was the emphasis placed on individual creative design and art, for it in reality was a revolution against the conformity of machine-made products. The movement was also an attempt to give individuals, including the laboring class, a chance for aesthetic expression in a world which many felt was denying the masses this privilege. Supporters of the movement further believed that the practice of a handcraft aided in the development of the faculties of thought and imagination which were being stifled by the resultant structure of the Industrial Revolution.

Growth and Confusion

Although there was disagreement among educators regarding the exact title, objectives, methods, and content of general
industrial education, there was nevertheless an increasing interest in the subject. The last two decades of the nineteenth century saw much activity and attention devoted to the nature and place of this area of general education commonly referred to by the term manual training.

**Founding of Teachers College.** In 1880 there was formed in New York an association which fostered a modified form of kindergarten work, stressing industrial study through elementary manual operations. So important was the place of hand training to the members of this group that it was disbanded in 1884 to enable a reorganization to take place. The outcome of this organizational change was the founding of the Industrial Education Association of New York City.

The popularity and success of this organization soon became apparent. By 1887 nine hundred and ninety-two pupils were given instruction. However, since only sixty-five of these had been teachers, the organization felt that a complete program of teacher training was necessary if the objectives of the organization were to be fully realized.\(^\text{31}\) The consequence of this problem was the establishment of the New York College for the Training of Teachers. The

\(^{31}\text{Bennett, History . . . 1870 to 1917, p. 467.}\)
president-elect was a professor of philosophy and education at Columbia University, Nicholas Murray Butler. In addition, "three other professors were named to the faculty; a professor of domestic science, a professor of mechanical drawing and woodworking, and a professor of industrial art." In subsequent years the program at the New York College for the Training of Teachers expanded. Personnel changes were made; the faculty increased in number. In 1893, the name of the school was changed and it became known as Teachers College, Columbia University.

**Experimentalist Influence.** Just prior to the turn of the century, there was in the schools a reaction against sequential manipulations in elementary school. Educators felt more strongly that educational handwork should be used as a method in studying not only industrial subjects but the other school subjects in the curriculum as well. An outstanding leader in this philosophy was John Dewey.

In 1899 Dewey wrote his controversial work, *School and Society*, strongly emphasizing the place of industrial occupations in the school curriculum. Not only did Dewey feel that the manipulative subjects had value as a method of teaching, but he believed

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32 Anderson, p. 169.
that the content of industrial study was of extreme importance to the youth living in a factory age. Dewey pointed to the difference between the family life prior to the inception of the factory system and after it. He felt that during the time prior to the Industrial Revolution children had the opportunity to learn about the industry in their society by observation of neighborhood craftsmen and workers. However, with the advance of the factory, many of the industrial processes were removed from the home and neighborhood shop, where they were readily observed by curious youths, to factories which in general were inaccessible to nearly everyone. Since this road to education was closed, Dewey felt that it was the responsibility of the school to give its students a knowledge of the industrial society in which they lived. In addition Dewey felt that the industrial processes were becoming increasingly more technical and scientific and that it was necessary to study industry in a systematic manner. He felt that this could be done only through the schools and not through factories.

There was yet another reason for Dewey's promotion of public school industrial education. Dewey, like certain others before him, felt that manipulation and physical participation in activities directly connected with the subject being taught were extremely necessary for real learning to take place. He felt that through the
manipulative study of industrial materials, processes, and products, learning not only of industry but of related subjects such as mathematics, science and social studies took place.

The Twentieth Century Begins. The manual education subjects were generally looked upon with favor by the American people at the turn of the twentieth century. Although there were deviations regarding the most tenable approach to insure each student the necessary education in manual and industrial experiences, there was agreement that such education was a necessary general education experience. Spurred by the exemplary work of such leaders as Woodward, Runkle, Larsson, Eriksson, and Sheldon and more recently encouraged by the discourses of Dewey and his disciples, manual education enjoyed a position in the school curriculum such as it would not experience for years to come.

There were three terms by which the manual education subjects were generally known at this time. Although each term had a specific meaning, based on its origin and initial application, the terms were used interchangeably by both laymen and educators.

The most commonly used term was manual training, a name made

33 Perhaps the most informative yet concise discussion of the origins of manual education terms can be found in Charles A. Bennett, "What's In A Name?," Industrial Education Magazine, XXXVI, No. 5 (November, 1934), 233-41.
popular by Woodward in the last two decades of the nineteenth century. A second title was manual arts, a term its users felt combined the features of the arts and crafts movement and manual training. The third and least popular term was mechanical arts. It had its American origin in the 1600's and was used originally to identify a program which attempted to study the arts and theory of mechanical construction.

By 1902 not only was manual training offered as part of the regular school program but many cities were conducting well-attended summer or "vacation" school programs. Tibbits writes:

The vacation schools are an established fact. . . . They are today the most potent agency in popularizing these [manual training] subjects or modes of study with the masses in large cities. \(^{34}\)

He subsequently describes the summer program operating in the New York City schools of the period whose activities consisted of the traditional projects of the period with basketry the most popular of the vacation school activities.

A New Departure. The view regarding the place of manual training in the schools was discussed at many association meetings and conferences during the early 1900's. From reports of the

meetings, there appears to develop at this time a definite cleavage among educators regarding the function of manual training. Educators advocating a new philosophy placed more and more emphasis on the development of the child as an individual. These teachers believed strongly in an intermediate school experience which would offer each student an opportunity to explore the society in which he lived. Many were apostles of the Dewey movement and favored the experimentalist approach to teaching. They vigorously attempted to divorce industrial education from the manual training concept.

There are many instances of support for the new movement, if it may be called that. For example, Mrs. M. L. Coull, Supervisor of Kindergartens, Menomonie, Wisconsin, stated at a meeting of the Northwestern Wisconsin Teachers Association in 1902 that "the name 'manual training,' like the term object lesson, has been misunderstood. It has called attention to the production of things more than to the production of character."35 She further outlined four "conditions necessary to the planning of all constructive work in the school." The first was a need which was understood and appreciated by the child; second, the final product was to have social value; third, the work involved was to be varied in order not to "overtax

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the child's powers in any one direction"; finally, the interest aroused in the child by his activity was to be strong enough to make him desirous of studying the materials and processes related to his activity. 36

One of the prominent schools founded to implement the new approach to learning was the Speyer School, an experimental junior high school associated with Teachers College, Columbia University. The aims of the school, which were subsequently visualized as the ideal aims of all junior high schools, were stated by Dr. Briggs:

To teach pupils to do better those desirable activities that they will do anyway and to teach these by means of material in itself worthwhile.
To reveal higher types of activities and to make them both desired and, to an extent, possible. 37

The course at the Speyer School was divided into three phases: instruction, observation, and manual activity. Dr. P. Cole describes the course in one of his publications:

Instruction will begin with the description and history of industries conducted near the school, and will extend to all the great national industries. . . . Observation will involve excursions to farm, factories, or govern-

36 Ibid.

37 Dana Z Eckert, "Exploratory Opportunities of the Junior High School," Industrial-Arts Magazine, XII, No. 5 (May, 1923), 171.
ment works in the neighborhood. Manual work will be necessary in order to prepare for instruction and to fix its results, and will also serve to illustrate objects and implements that have been observed. 38

Further reflecting the progressive thinking of the time was Charles R. Richards, who in 1904 through a challenging editorial in the Manual Training Magazine, asked of his colleagues:

Have we not come to the time when a change is urgently needed in the term applied to constructive work in the schools? Is there a manual-training teacher in the country who does not increasingly feel the need for a more explicit and dignified title for his professional work. 39

Continuing, Richards criticized the existing dichotomy between the practiced manual training and the definitions and objectives of the new education which no longer stressed fundamental construction.

To identify the former, he proposed the name Industrial Art. In Richards' words, the term . . . indicates a definite field of subject matter. The word Art is inclusive of both the technical and aesthetic elements, and the qualifying word points specifically and comprehensively to the special field of our material. 40


40Ibid.
Although Richards concluded with the hope that his proposed name would stir much discussion and would result in a change, his hope was not to be soon realized.

There were advocates of manual training other than those directly connected with the manual training movement. Charles Eliot, then president of Harvard, said of manual work in education, "I believe there is as much mental training in manual work as in any book whatsoever. . . . I believe there is more value in manual work than in nine-tenths of the arithmetic given in the schools." 41

Noyes reviewed manual arts in 1904 and surmised that . . . manual arts will be as they have been, an opportunity for the acquirement of manual skill, but simply that they will not be. They constitute far more than a method of training. Their field is the appreciation of modern art and industry as functions of modern social life. 42

Ballou's Survey. In 1907 Ballou presented a report on the status of manual training in the public schools of the United States. The study was based on a questionnaire sent to all school superintendents in cities with a population of more than eight thousand people. Ballou found, among other things, that it was the "custom"


to introduce manual training in the eighth grade. It is interesting to note that Ballou found the manual training introduced in the primary grades (one through four) to be "in most cases 'busy work'" not considered by many as manual training work. The real status of manual training in the elementary schools of the period is definitely reflected in another finding. Ballou writes of the elementary school program:

After the time is allotted to the fixed subjects in the elementary program there is very little unoccupied time which can be devoted to the subject of manual training. This condition makes it impossible to expect that as much time would be given to the subject of manual training in the elementary school as would be given it in the high school where the course of study required courses does not occupy so completely the time of the student.

Although manual training was not consistently included in the school program, Ballou found that on the elementary level 89.9 percent of the elementary schools having the subject required it. The prominent reason for this probably was the feeling on the part of educators and administrators that at the elementary level students were not mature enough to "elect" subjects. On the secondary level,

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44 Ibid., p. 12.
quite the opposite was found; only a few of the reporting cities re-
quired manual training.

Ballou also found that, contrary to popular opinion, most of the manual training courses found in the schools were the result of educators' promotion and not a result of popular demand of the people. However, this finding may be due to the fact that the school superintendents who completed the questionnaire were reluctant to give recognition to local pressures in instituting new courses in the schools. Ballou further found that seventy percent of reporting superintendents reported no local objections to the manual training program; when objections were listed, the leading one was to the high cost of program operation.

**Industrial Arts Gets Definition.** Toward the end of the first decade, certain educational leaders began to give definition to Richards' industrial arts. In 1909, James E. Russell, then a professor at Teachers College, vigorously attacked the manual training of the time. The main stream of reasoning behind this attack was that the importance of the training of the hand, such as was stressed in the manual training and manual arts systems, did not have the cultural value its sponsors said it had. Russell clearly stated this position when he wrote:
Some got the notion . . . there was a magical charm in the training of hand and eye. Manual training was heralded as the remedy for all defects of vision, mental and physical, and the claim was made that in whittling . . . wood the boy was really shaping his own character. . . . Until within ten years, manual training was defended by its over-zealous advocates on the grounds of its values as a mental and moral discipline. It is difficult for us to see, even after the lapse of so few years, why so great worth was imputed to manual dexterity and so little value attached to good reading. . . .

Russell proposed in place of the existing two-fold curriculum, basically including humanistic and scientific courses in addition to manual training and other "frill" courses, a three-fold curriculum consisting of humanistic, scientific, and industrial courses which he felt would provide the student with a more liberal education. He strongly advocated the inclusion of a study of the industries of the time emphasizing that youth left school with no knowledge of this important part of society.

Surveying the existing situation, Russell felt his proposal would "retain all that is of real worth in manual training and at the same time . . . get something still more to be desired." He proposed a study of industries and their materials and felt that:

For pedagogical purposes, the materials of most significance in the industries are (1) foods, (2) textiles, (3)

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46 Ibid., p. 440.
woods, (4) metals, and (5) clays and other allied earth materials. Fuels, . . . occupy a middle ground between industrial materials and the motive power employed in the industrial arts. Commerce is that industry which uses the products of all other industries in making things available for human consumption.  

His next step was . . . to single out the dominant processes in the successive stages of production, manufacture, and distribution, and their interrelations, peculiar to each class of materials. The facts concerning these processes constitute the subject matter of instruction in the industries. The technical skill required in the operation of any industrial process is the object of vocational training.  

Under Russell's proposal, manual training, fine and domestic arts, and manual arts would no longer exist in the elementary school but would be replaced by one subject called industrial arts.

A few years later Frederick G. Bonser, also a professor at Teachers College, Columbia University, further expounded on Russell's proposal and with the social philosophy of Dewey attempted to reform elementary education. His influence was far-reaching and his definition of industrial arts is still used today. Bonser defined the subject as . . . a study of the changes made by man in the forms

47Ibid., p. 442.  
48Ibid., pp. 442-43.
of materials to increase their values, and of the problems of life related to these changes.49

In 1914 Bonser challenged the educators of the time when he wrote:

Which shall it be, Industrial Arts, a subject almost unlimited in possibilities for rich thought content of fundamental importance to everyone in our day, or Manual Training, a subject, which if it remains what its name really signifies, is devoted merely to the development of the hands--Industrial Arts, a term which suggests mental content and training using the handwork as a most important means, or Manual Training, suggesting something not at all largely inclusive of mental elements?50

The Vocational Education Movement. While the manual training subjects enjoyed a high position in the school curriculum at the turn of the century, the area of study was increasingly reappraised with skepticism. One prominent reason for this re-evaluation was the increased interest in vocational education. Since the schools were keeping youths longer, through compulsory education laws, people felt that these students should prepare for the realistic world of work which they would soon enter.

There were a number of specific major developments which


50 Frederick G. Bonser, "The Significance of a Name," Industrial-Arts Magazine, I, No. 3 (March, 1914), 55.
promoted the cause of vocational education in the first decade of the twentieth century. The first of these was the formulation in 1905 of the Douglas Commission, also known as the First Commission on Industrial Education, a group appointed by Governor William L. Douglas under the authorization of the Massachusetts legislature to survey existing educational needs for the training of individuals for skilled positions in the various industries found in the state. According to this history-making investigation, there was widespread dissatisfaction with the present manual training programs, but there was also state-wide interest in specialized vocational education, probably promoted by the lack of skilled workers available for industrial positions. The report of this commission emphasized that workmen needed not only manipulative skills but also a development of "industrial intelligence." In part, the commission recommended that existing educational programs be modified to include instruction

... in the elements of productive industry, including agriculture and the mechanic and domestic arts, and that the instruction in mathematics, the sciences, and drawing should show the application and use of these subjects in industrial life.  

The commission went further to emphasize that the integrity of the public school system should be preserved; it did not recommend

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that the structure of the system be changed but only that the content of material covered be modified and that the proposed vocational education be started at the elementary level.

In 1906 the Second Commission on Industrial Education was established and given the responsibility for the establishment of vocational education on the public school level. The success of the commission was limited for several reasons, one of which was the inability of its members to agree on the identification of common problems. Although subsequent legislation did establish a primitive kind of industrial education program on elementary and secondary school levels, it also created a dual system of education; this, however, lasted only until 1909 when the commission was merged with the State Board of Education.

Perhaps the most influential organization in the vocational education movement in the early part of the twentieth century was the National Society for the Promotion of Vocational Education, founded in 1906. The organization was comprised of businessmen and educators from many eastern states and included Charles R. Richards, the former instructor of manual training at Columbia University and Pratt Institute, as its prominent leader.

The influence of the National Society for the Promotion of Vocational Education grew. In 1918 the name of the society was
changed to the National Society for Vocational Education, and this organization merged in 1926 with the Vocational Education Association of the Middle West to form the powerful American Vocational Association.

In 1907 the National Education Association Committee on the Place of the Industries in Public Education was appointed. In its report presented in 1910, it stated that

... in the field of elementary education ... the continuous and, at times, strenuous discussion for thirty years has not produced results commensurate with the importance attributed to manual training by its advocates. 52

It further stated that

... in the field of secondary education there is even greater discrepancy between the promise of theory and the reality of practice. 53

The committee also indicated that in the elementary school the place of manual training was one of an exploratory nature, while on the secondary level its purpose was especially to prepare students who would terminate their formal education with high school. The place of educational handwork on the secondary level definitely had a purpose beyond the general education function.

In 1914 the Federal Commission on National Aid to Voca-

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52Anderson, p. 203.
53Ibid.
tional Education was created to study vocational education. From the preliminary but thorough investigation of the commission, the Smith-Hughes Act was structured and signed into law by President Woodrow Wilson on February 23, 1917. Upon this act, considered a milestone in the struggle for federal aid to vocational education, subsequent legislation for federal support has been based.

During the decade beginning with 1907, the relationship between industrial arts and vocational education was one of rivalry. Led by the National Society for the Promotion of Industrial Education, vocational educators attempted to promote vocational education in part at the expense of industrial arts. Bawden wrote:

During this period there was no doubt about the attitude of the vocational education leaders on the subject of industrial arts. It was one of unqualified disparagement and contempt. Through sheer ignorance in some cases, and by intent in others, there was seldom any discrimination between good industrial arts and bad industrial arts. It was all condemned, notwithstanding the fact that... there were programs of industrial arts that were more defensible from the standpoint of the public good than some of the programs defended as vocational education. 54

Summary

The history of industrial arts just prior to the third decade of the twentieth century is one of rapid growth, controversy, and

conflict. The basic ground for any disagreement and vagueness lies with the conflicting definitions and objectives related to the manual training subjects through the ages.

One of the earliest findings of manipulative work as a form of education took place in the ancient Jewish civilizations. During the period of Greek and Roman prosperity, manual education was regarded with the lowest esteem and was termed the "banausic arts." Although skilled craftsman were largely responsible for the comparatively high standard the citizens of those ancient nations enjoyed, it was not until the monastic civilizations of the Dark Ages that educational handwork achieved recognition as an important form of education.

With the Renaissance came rebirth and discovery in such areas as scientific law, art, literature, and technology. The results of this period of discovery and re-discovery included interest in the study of industry as a form of general education. Philosophers and writers such as More, Rabelais, and Campanella stirred the classes with challenging proposals for education. These were followed by Luther, Bacon, Petty, Dury, and others who attempted to implement some of the theories of their predecessors. Climaxing this period of growth is the work of Comenius, who is sometimes referred to as the Father of Industrial Arts.
With the demands of the Industrial Revolution, a renewed emphasis was placed on industrial education. The work of such men as Pestalozzi and von Fellenberg was highly influential in structuring programs featuring educational handwork at that time. To further meet challenges of the period, three systems of education evolved in Europe which were to have a profound influence on education in America: the Russian system of manual training, the sloyd system, and the arts and crafts movement.

It was at the Philadelphia Centennial Exposition in 1876 that the European systems of manual education were introduced into the United States. Meeting the most favored reception, the Russian system was soon implemented by Runkle and Woodward on two different educational levels. However the Russian system was not without criticism, and it soon lost popularity which was gained by the sloyd system. This in turn also lost its initial acceptance due to certain inadequacies and thus permitted the promoters of the arts and crafts movement to gain a foothold in the educational curriculums of the time.

During the first decade of the twentieth century, the term industrial arts was introduced and was defined by educators who were strongly in favor of industrial arts in elementary and intermediate education. It was also at this time that the vocational education
movement began to draw increased attention. The feelings of supporters of the vocational education movement were climaxed with the passage of the Smith-Hughes Act in 1917.
CHAPTER III

INDUSTRIAL ARTS IN THE 1920's

The manual training subjects, largely overshadowed by the popularity of the vocational education movement, were a greatly misunderstood group by the end of the second decade of this century. The promoters of vocational education were both rejoicing in the passage of the Smith-Hughes Act and preparing for new legislation to further spur and support vocational education programs. One reason for the popularity of the vocational programs was the recent war effort which stressed the importance of preparing vocationally proficient citizens. Vocational education had an immediate purpose and, equally important, it had the financial means necessary to support this cause. Manual training, as the most popular of the manual training subjects at this time, had the remnants of a past glory.

The third decade of the twentieth century found manual training under pressure from many groups to change. Some years before, Bennett addressed a Milwaukee meeting of the Western Drawing and Manual Training Association and identified three sources of pressure:

1. From those who wish to see manual training become more distinctly vocational in nature.
2. From those who would make manual training chiefly a vehicle for teaching applied arts.
3. From those who seem to believe that a shop organized as a producing factory will give better educational results than a shop organized as a school.¹

The manual training subjects were the product of three European systems of manual education and one American movement. It was possible to find programs of industrial arts education resembling each of the European systems; to add to the confusion, from the literature of the time it is apparent that there was no one definite term used consistently to identify this education. Three major terms were used interchangeably—manual training, manual arts, and industrial arts, even though each term did in fact evolve from a different philosophy of manual education.

Manual training, developing from the Russian system of education, was basically a subject centered around the completion of specific exercises. The emphasis was primarily on skill development. Although defended through numerous arguments as a phase of general education, the value of this teacher-centered program was under much criticism from liberally-minded individuals.

Manual arts, a merger of the sloyd system which stressed the completion of projects or useful items and of the arts and crafts

movement, was project-centered although its supporters claimed that the child was given the opportunity to create and to express himself through the manipulation of industrial materials. Although the emphasis was also on the development of skill, the skills emphasized were hand skills and the project was the vehicle used to achieve objectives. Finally, industrial arts, the result of critical examination of the former subjects, reportedly was devoted to the study of industry. While the project was still the vehicle used to obtain most of the objectives of industrial arts, its supporters stressed the individual differences of pupils and attempted to establish their program to allow individuals to express themselves independently. This program was pupil-centered.

Continued Growth and Confusion

A major consequence of the multilateral existence of the manual training subjects was confusion, both professional and non-professional. Verne C. Fryklund, an instructor at the State Teachers' College, Kearney, Nebraska, described the fluctuating views regarding manual training from its inception to its position in the early 1920's:

So much was said of the rigidity of early manual training without accompanying interest that another extreme took its place. . . . Progress was lost and the boy in the eighth grade was at liberty to make over again things
that he had made in the sixth grade. . . . Next followed
an extreme in inductive teaching, which completed the
change; then the boy was allowed to make whatever his
interest dictated, using a trial and error method with some
individual instruction. 2

Fryklund stressed the absence of the application of scientific prin-
ciples in the latter approach and indicated that it also encouraged
waste in the use of materials.

Arthur B. Mays, Associate Professor of Industrial Education
at the University of Illinois, called for a reappraisal of the aims and
objectives of the manual arts warning that the

young teacher who undertakes to study the various state-
ments of objectives is soon bewildered by the variety,
vagueness and multiplicity of aims. The almost inter-
minable lists of objectives which are sometimes submitted
as the aims of a teacher frequently become amusing for
they contain nearly all of the desirable human attributes,
and on their face are impossible of attainment with all of
the school subjects combined, and certainly no one subject
can be held accountable for their realization. 3

An editorial in the Industrial-Arts Magazine in 1923 cited
the confusion in industrial education terminology of the period:

After all these years of discussion concerning the
proper terminology for the field of vocational education,
industrial education, industrial arts, manual training,

2Verne C. Fryklund, "Lest We Forget," Industrial-Arts
Magazine, XII, No. 5 (May, 1923), 185-87.

3Arthur B. Mays, "Enrichment of Manual Arts," Industrial-
Arts Magazine, XII, No. 4 (April, 1923), 131.
etc., it is the most common thing to find the terminology wholly confused and frightfully misused.

It is not unusual to find the simplest forms of handwork in the primary grades referred to by school people as "vocational work,"... Every cross-roads manual training shop is turning out "vocational work," according to inspired reports... The fact is that a lot of teachers became alarmed at the prominence given vocational education and widespread demand for it; they became ashamed of the old terms "manual training," "manual arts," "industrial arts," etc., and took cover under the new and popular name of vocational education. 4

Nevertheless, manual training programs in the early 1920's did not disappear from school curriculums; instead they seemed to increase in popularity and number. Perhaps a major reason for this movement was the increasing number of students who attended secondary schools in the 1920's. With growing compulsory education laws, no longer was a high school education reserved for youth of the privileged class. Maris M. Proffitt of the United States Office of Education, in the Biennial Survey of Industrial Education, 1926-28, reported:

The student body of the secondary school is no longer the selected, unified group it once was, and with the inclusion, in large numbers, of groups with different attitudes, aptitudes, and opportunities relative to life occupational interests there is the necessity for providing

educational training that will have functional values corresponding to the group needs and will be commensurate with the time, effort, and money expended.  

William E. Warner of The Ohio State University wrote of four methods of shop organization existing in the twenties. The first was The Ettinger Plan, named after Dr. William L. Ettinger, a former Superintendent of Schools in New York City. The principal characteristic of this organization was planned student activity in a selected number of "special or unit shops." The second organization, called The Gary Plan, was developed under Superintendent William Wirt of Gary, Indiana, and provided industrial arts experiences "under the direction of an experienced tradesman." The Russell-Bonser Plan, also known as the Industrial-Social Theory, was the third plan and featured "a series of general contacts with industrial materials in a 'general' or 'composite' shop." The fourth method, The Pittsburgh Plan, was a combination of the Ettinger and Bonser plans. Under The Pittsburgh Plan a student studied for one year in a general shop to discover his interests and then studied for the remaining time in a unit shop.

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Elementary School Industrial Arts

During the 1920's the manual training subjects enjoyed an increased acceptance in the elementary school curriculums. It was at this level of education that the term industrial arts appeared to be applied most consistently to describe the area of study.

Influence of Bonser. The most influential leader in elementary school industrial arts in the 1920's was Frederick G. Bonser. While his definition and objectives for the subject were meant for the discipline on all levels of study, it was in the elementary programs that his specific characteristics were largely implemented.

Shortly before the third decade Bonser, in an address at the meeting of the Eastern Arts Association in Massachusetts, stated:

In the elementary school, the emphasis in the study of the industries must naturally and necessarily be placed upon the materials, processes, and methods that bear upon the selection and use of industrial products. That kind of study of foods, clothing, shelter, utensils, tools, machines and other utilities which gives a knowledge of quality, economic value, artistic excellence, and appropriate usage includes practically all other elements of value as by-products in the study of industry.\(^7\)

In 1922 Bonser stated three purposes of industrial arts in the elementary school:

1. To develop intelligence, efficiency, and enjoyment in the use of industrial products.
2. To develop intelligence about the work and conditions of industrial workers.
3. To cultivate a sympathetic, appreciative attitude toward the workers and an intelligent interest in sharing in the means for regulating the production, distribution, and use of products which will assure fairness of treatment to all alike. 8

Bonser further stressed four fundamental impulses in children which are directly related to industrial arts: (1) the 'Manipulative Impulse,' (2) the "Investigative Impulse," (3) the "Arts or Aesthetic Impulse," and (4) the "Social Impulse." Bonser emphasized that here "are four great impulses of children... providing equipment for directing their activities, physical and mental, toward many desirable objectives... ." 9

Bonser felt that industrial arts was a subject of definite content; he believed that the consequential growth of a student studying contemporary industry was tangible. He summarized his feelings when he wrote:

I commend the subject to your consideration on the basis of measurable values. These values are measurable in terms of actual improvement in the quality of

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9 Ibid., p. 132.
our standards of living, both in utility and beauty. They are measurable in terms of the quality of our intellectual interests and the excellence of cooperation in our citizenship. ¹⁰

In 1923 Bonser and Mossman, an associate professor at Teachers College, published their book, *Industrial Arts for Elementary Schools*, which was to become a standard text on elementary school industrial arts for many years to come. In this publication five objectives or purposes of industrial arts were presented: (1) a health purpose, (2) an economic purpose, (3) an art or aesthetic purpose, (4) a social purpose, and (5) a recreational purpose. The organization of industrial arts was based on the "needs of man for six kinds of service," namely food, clothing, shelter, utensils, records for transmitting experience, and tools and machines. ¹¹

This structure was to be reflected in many ways in future elementary school industrial arts programs.

**Secondary Influences.** In 1920 A. Rudolph, Supervisor of Industrial Arts in Philadelphia, Pennsylvania, wrote of elementary school handwork and described it as an evolution in six stages: the

¹⁰Ibid., p. 134.

first or "Disciplinary" stage, the second or "Utilitarian," the third
or "Typical-Industrial," the fourth or "Aesthetic," the fifth or
"Social," and the sixth or "Real-Industrial." Rudolph further wrote
of this final stage:

The last stage constitutes ... the broadest interpretation of the subject it has yet received. ... At
present it seems to us as tho handwork had found
its true mother in the study of industry, and that the day
is dawning when handwork will be assimilated into the
regular school curriculum as the means of concrete ex-
pression.12

Rudolph thought of the study of industry through handwork
as a means of expression similarly as words were means of express-
ing ideas. He organized this work into two major parts, "illustrative
handwork" and "representative handwork." Rudolph did not refer to
his proposal as an industrial arts program; he used the term indus-
trial arts to designate a specific part of his program of handwork,
namely that undertaken in grades five and six. His division of sub-
ject matter in this segment of the program was very similar to that
proposed earlier by Bonser and others.

Frank Leavitt, Associate Superintendent of Schools, Pitts-
burgh, in the late 1910's and early 1920's proposed a program of

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12 A. Adele Rudolph, "Industry as an Elementary School
Subject," Industrial-Arts Magazine, IX, No. 5 (May, 1920),
181-85.
"manual arts" courses for the first eight grades. One of his reasons forsolidifying a program was an attempt to present a solution to the problems confronting a new administrator who wished to organize and implement a course in manual arts. He said of the existing situation:

There is practically no basis of commonly accepted, standardized theory or practice on which a school officer may form a course of study with entire confidence. In other words there is no such common understanding of the purposes and practices of instruction in the manual arts as can be found in most of the so-called academic studies now taught in the elementary school.\textsuperscript{13}

Leavitt listed nine objectives for manual arts, developed by a committee of educators in 1917 and 1918, to be used as a guide for constructing courses. He emphasized that it was not necessary, as many educators implied, that each of the following objectives be realized in every grade.

1. To develop handiness.
2. To promote the immediate carrying over of ideas into action.
3. To help discover special interests and aptitudes important for vocational guidance.
4. To provide a means for developing technical skill.
5. To provide a means for imparting technical knowledge.
6. To enable the pupil to apply the test of practice to

some of his thinking.

7. To develop the mind by providing constructive problems, in materials, which demand a vigorous mental reaction.

8. To interest in school work those pupils to whom the traditional studies do not appeal strongly.

9. To create interest in the arts and industries without any reference to their vocational significance.\footnote{\textit{ibid.}, p. 1.}

Leavitt's program, reflecting the popular concept of manual arts in the elementary schools, emphasized manual work as a means of pupil exploration and development and stressed the minor role of the project as the all-important concern.

\textbf{Status of Industrial Arts in the Elementary Schools}

During the early years of the 1920's, a revealing study regarding the status of industrial arts education was reported by A. H. Edgerton, an assistant professor at Indiana University. The study included 352 teachers from 141 "progressive" school systems in 19 different states. One outstandingly favorable finding regarding elementary school industrial arts indicated that those courses which are designed for studying present-day industries in an elementary way, in order that boys and girls may be more intelligent and appreciative of the conditions, materials, processes, and methods involved in manufacturing the products observed in everyday
life are rapidly replacing the... courses, many of which have had the doing and making of things as their primary aim or purpose.\textsuperscript{15}

Throughout this study industrial arts as a subject involving the study of industry was emphasized. In most schools industrial arts was approached via the analysis and study of groups of related industries. Seven such groups were included in the survey: shelter and furniture; textiles and clothing; food and allied activities; paper and printed products; pottery and other earthen products; tools, machines and other utilities; and handwork including among other things weaving and basketry.

A number of teachers participating in the study indicated that by the time a student completed six years of elementary school he should

1) have a fairly clear but general understanding of the production in the important industries which are being carried on about him.
2) know something of the persons that are engaged in these industrial pursuits.
3) be somewhat acquainted with the possibilities that are open to him in such occupations.\textsuperscript{16}

Although the survey revealed many positive characteristics


\textsuperscript{16}Ibid., p. 337.
of existing elementary school industrial arts programs, it also re-
vealed the inconsistency of methods and subject matter included
when an exemplary program representing the ideal program was
sought. Edgerton expressed the desire of many industrial arts
teachers of the period when he wrote:

It is to be hoped that the time is not far distant when care-
ful study and impartial experimentation may aid us in de-
termining the comparative values of our most feasible
methods by fairly and thoroly [sic] testing them in some
definite way. However, until more accurate means have
been devised for ascertaining the truth (facts rather than
opinions) regarding what and how pupils from approxi-
mately 6 to 12 years of age can learn most effectively and
economically, it behooves those who are responsible for
organizing and conducting the industrial arts activities to
select and try out various appropriate methods and practices,
as conditions permit, in order that the results may be care-
fully observed, tested, and compared whenever possible.¹⁷

Almost all of the teachers participating in the survey in-
dicated a need for industrial arts to give attention to

1. **Motor expression** as a means of stimulating interest
   and mental activity, and of developing the muscles and
   senses to a reasonable degree.

2. **Information** regarding common industrial materials,
   processes, products, and developments to make pupils
   conscious of important divisions and relationships in
   their complex social environment.

3. **Situations** involving some understanding of the human
   factors in the workday world to encourage thoughtful ap-
   preciation of the possibilities for social service and in-
   dividual expression.¹⁸

¹⁷Ibid. , No. 11 (May, 1922), 377.

¹⁸Ibid. , No. 12 (June, 1922), 413.
Junior High School Industrial Arts

At the start of the third decade, the junior high school or intermediate school as it was also called, though still in its infancy, was rapidly increasing in popularity. One immediate consequence of this evolution was experimentation in the teaching of all subjects. It was recognized by the majority of educators and administrators working to promote the junior high school movement that the "intermediate" state in the pupil's life should provide an abundance of exploratory experiences; industrial arts was considered by many as having the potential to offer some of these basic experiences.

Industrial education in the junior high school had already completed one revolution by 1920. When the subject was first introduced in the junior high school, the purposes of the program were generally vocational. Obsessed with the popular pressures which resulted in part from the vocational education movement, the general public urged many local boards to include vocational education in the school curriculum as early as possible. Since at the time many students did not complete their secondary school experience, it was believed that the junior high school should offer vocational education in the seventh grade. However, the weakness of this philosophy soon became evident and by the 1920's most of the junior high schools had abandoned purely vocational programs.
Status of Industrial Arts in the Junior High School

Early in the twenties Edgerton revealed a comprehensive study, including 379 schools throughout the country, of industrial arts in the junior high schools. Supporting the statements of other educators of the period, Edgerton found that the 303 "most progressive" schools reporting recognized the "purpose of the [industrial] work and study in these courses. ... [as] not primarily to produce skilled workers for definite vocations."

There appeared to be a definite relationship between the size of a city and the number of areas included in the industrial arts program. Edgerton found that benchwork and drawing were the prominent types of activity in 97 percent of the schools located in cities with a population of 5,000 to 10,000, while 75 percent of the schools located in cities with populations of 25,000 or more inhabitants had diversified programs at times including 16 areas of study. Twenty percent of the reporting schools provided experiences with wood only; 78 percent indicated the inclusion of "many operations or processes without respect for the needs and interests of their pupils."  

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While the reasons for the inclusion of industrial arts varied, Edgerton did find four common reasons, listed in order of importance, for such study:

1. Contributing to the general experience, all-around development, and industrial intelligence.
2. Aiding in the intelligent selection of industrial occupations without encouraging early choices.
3. Enriching the school experience of the pupil through concrete situations.
4. Preparing for entrance into industrial vocations in the school and through cooperation outside.\(^{21}\)

The project method of learning was favored by ninety percent of the reporting schools although the emphasis and place of the project varied markedly among schools.

In 1922 Kenneth V. Carman of Columbia University conducted a study involving 225 educators and administrators representing the junior high school industrial arts programs in 43 states. The purpose of the study was to determine "the real aims and objectives" of the industrial arts programs in junior high schools and to determine the type of laboratory facility, the unit shop or general shop, which was best suited to accomplish the aims and objectives.

In determining the objectives of the program, Carman offered his participants a number of published statements regarding

\(^{21}\text{Ibid., No. 11(November, 1921), 407.}\)
the aims and objectives of the junior high school industrial arts program. The descriptive statement which received approval from a definite majority was the following taken from the Eastern Arts Association proceedings of 1916:

The purpose of the work. . . may be stated as including values for increased practical efficiency and more intelligent citizenship; trying out of vocational guidance values; and values in concrete experience giving motive for and interest in the subjects related to wider vocational and social interest. . . . To these may be added the specific training values for those who will enter industrial vocations. . . . Here, as in the elementary school, industrial intelligence, insight and appreciation constitute the largest values, and these should not be subordinated to the mere manipulation of tools.22

Regarding the most appropriate physical facility to accomplish this purpose, most reporters indicated a definite preference for the comprehensive laboratory for small schools, while the unit shop was preferred in the larger schools. The consensus seemed to favor the unit laboratory if the school was large enough to justify the expenditure of money necessary for such facilities.

One of the major studies in the second half of the decade was undertaken at Teachers College under the direction of David Snedden. While teaching a course concerning industrial arts in

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junior high schools, Snedden and some of his students undertook the task of reorganizing and reformulating the numerous objectives of junior high school industrial arts stated at the time. The final report of this study was published in 1927 with the title Reconstruction of Industrial Arts Courses.

Seven "essential characteristics of junior high school industrial arts" were cited in the reconstruction: (1) activities utilizing the materials and tools of industry as the "central and controlling phases of industrial arts studies," (2) the derivation of industrial arts subject matter from "any division or field of industrial work as broadly defined," (3) the activities involving the learners in "large amounts of manipulative activity" including "construction, disassembly, and assembly" utilizing as many industrial materials as possible, (4) the type and complexity of the project or experience undertaken determined by the "maturities and other characteristics of junior high school pupils," (5) the study of commercial and industrial processes on a miniature scale, (6) the final project selection based on a number of conditions such as marketability, service, or value, and (7) the inclusion of girls on an equal basis with boys in industrial arts study. 23

23Snedden, pp. 14-16.
Experimental and Exemplary Programs. There existed many experimental junior high school industrial arts programs in the 1920's. One of the more prominent programs was implemented at the Lincoln School of Teachers College, Columbia University. The program had a general shop for its physical setting because of the variety of experiences which could be offered in such a setting.

Altho [sic] the equipment, the materials, and the technique were all chosen from important industrial pursuits, the recognized purpose of the work and study was not primarily to produce skilled workers for definite vocations but rather to help all pupils, regardless of their social standing and possible life work, to develop industrial intelligence and thinking power in connection with real life situations. 24

Three hours per week were devoted to this program during the seventh, eighth and ninth grades. The activities undertaken in the laboratories were "selected from such occupational pursuits as printing and publishing, carpentry, cabinet and furniture making, pattern making and foundry, sheet metal, forging, machine shop, concrete, general construction and repair, and the like." 25

Leon L. Winslow, Specialist in Drawing and Industrial Training, State Department of Education, Albany, New York,


25 Ibid.
described another junior high school program featuring twelve types of industrial work: (1) printing, (2) woodworking, (3) painting and decorating, (4) concrete, (5) brickwork, (6) metalworking, (7) drafting, (8) industrial art, (9) electrical work, (10) textiles and clothing, (11) baking, and (12) automobile mechanics. It is interesting to note that "industrial art" is one type of industrial work in Winslow's "industrial arts" program. 26

A. P. Twogood from Iowa City, Iowa, stated three "distinct purposes" for industrial arts in the junior high schools:

1. for the enrichment of the general curriculum.
2. for the development of the students' interests in industrial occupations.
3. for the acquisition of a more or less limited degree of manipulative skill. 27

He stressed that each objective required a specific type of curriculum but indicated that the second was the most popular purpose for junior high school industrial arts at the time.

Perhaps the most descriptive study of the manual training subjects in the junior high schools in the 1920's was made by William


E. Roberts, Supervisor of Manual Arts, Board of Education, Cleveland. In his subsequent report, Roberts found "two rather definite functions" of the manual training subjects. "First. To provide a means of general development and education. . . . Second. To provide a medium for educational guidance." 28

Summarizing the findings of his study, Roberts made a number of generalizations. Regarding objectives Roberts indicated that "there can be no doubt that there is a rapidly growing feeling that the primary objective of manual arts in the junior high school is educational rather than vocational." He found that educators thought "more clearly, to fix definite objectives, to evaluate these objectives, and to meet them in terms of methods and subject matter" than they had before. He found a "clearly recognized obligation" of the junior high schools to serve the student who failed to "keep up with the demands of the junior high school." 29

The Project Method. The project method of teaching was the most widely employed method in junior high school industrial arts programs in the 1920's. Snedden described the project as a


29 Ibid., pp. 10-12.
unit of "educative work in which the most prominent feature was some form of positive and concrete achievement." The project had four primary characteristics:

1) the undertaking always possessed a certain unity.
2) the learner himself clearly conceived the practical end or outcome to be attained, and it was always expected that this outcome was full of interest to him. . . .
3) the standards of achievement were clearly objective. . . .
4) the undertaking was of such nature that the learner, in achieving his desired ends, would necessarily have to apply much of his previous knowledge and experience. . . and probably would have to acquire also some new knowledge and skills. 30

Although the place of the project in this method of teaching was clearly defined, the project, not the pupil, was often the center of the industrial arts program.

The General Shop

The general shop in the 1920's was a comparatively recent idea basically differing from the traditional or unit method of teaching in that multiple activities were carried on simultaneously in one or more laboratories.

With the increased use of the term, general shop soon assumed multiple meanings. Denman Kelley, an assistant professor

30David Snedden, "The 'Project' as a Teaching Unit," School and Society, IV, No. 90 (September 16, 1916), 420.
of industrial arts at the Indiana State Normal School, wrote of two "general ideas" which the term general shop indicated. First, the term implied

... a round of shop activities by which a boy might spend some time, varying from three weeks to a year in each of several different shops. These shops would be the traditional shops doing woodwork, plumbing, printing, forging or whatever other shop activities the particular school might be equipped to do. The "general" idea would be in the fact that the student has had experience in enough different shop activities to give him a rather general industrial training without attempting to give him a high degree of skill and knowledge in any one line. \(^31\)

Secondly the term was used to imply "a single shop equipped with the tools and machines of several different trades all of which are being taught at the same time." \(^32\)

In the 1920's the latter implication of the term was the more popular one and related to it were two subordinate philosophies. The first was based on a unit-type program and featured work in individual areas, such as wood or electricity. The second centered around projects which would involve experiences in more than one shop area and would necessitate the student's working in many areas before completing the project.

\(^{31}\)Denman Kelley, "The General Shop as a Junior High School Activity," *Industrial-Arts Magazine*, XIV, No. 5 (May, 1925), 171.

\(^{32}\)Ibid.
Comprehensive Versus Unit Approach. One of the leading supporters of the comprehensive approach to general shop teaching was Earl Bedell, Supervisor of Vocational Education in the Detroit City Schools. He referred to the general shop as a physical setting and stressed that the term did not designate a course of study. He described a general shop as one which had

... a variety of equipment which will permit the carrying on simultaneously of activities in more or less widely separated fields, such as sheetmetal, woodwork, and electricity. Furthermore the activities are not taught as separate unit courses, but are organized into a comprehensive, logical and coherent subject forming a well defined course of study.\textsuperscript{33}

Bedell listed a number of objectives, stated earlier by Dr. Franklin J. Bobbitt of the Los Angeles schools, which were "generally accepted" as being descriptive of the general shop program of the time:

1. Ability to perform unspecialized activities about the house, basement, garage, yard, garden, motor car, etc.
2. Ability as a consumer to judge the qualities and values of the products of specialized occupations.
3. Ability, disposition, and habit of "observation" and "reading" of things in the world of productive industry as enjoyable and fruitful leisure occupations.
4. A proportional intellectual comprehension of the

world of productive industry, of the specialized occupational groups which compose it, and of tools, machines, raw materials, processes, products, etc., involved.

5. Ability to choose one's vocation.

6. A disposition and habit of being... independent, active, and positive in one's home life and one's affairs in general; not dependent upon others, passive and negative.

7. A disposition and habit of holding one's practical labors to reasonably high standards of performance;...

However, there were numerous educators and administrators opposed to Bedell's thinking. Clarence E. Howell, Supervisor of Industrial Arts in Lincoln, Nebraska, typified the supporters of the unit approach, stressing that:

The central idea is to combine within the four walls of one shop, experiences and instruction in various mediums and industrial processes. Thus we might consider a general shop in which there would be a unit of equipment for wood working, a unit for plumbing, one for automobile repair, and one for electrical work, all in the same room.

Advantages and Disadvantages of the Program. Regardless of the program structure used in the one-room general shop, the approach had certain advantages as well as disadvantages. Howell specifically summarized the advantages; referring to the one-room general shop he wrote:

34Ibid.

1. It provides varied experiences for the pupils.
2. It requires less room.
3. It requires less equipment.
4. It secures and holds better interest on the part of the pupil.
5. It enables the pupil to accomplish more in less time.
6. It makes sure that the pupil obtains a more varied experience while he is still in school instead of putting some of it off until he may have left.

In opposition to the above points, Howell cited six disadvantages:

1. Difficulty in securing and maintaining qualified teachers who are specialists in their lines.
2. Impracticability of trying to instruct or demonstrate to one group while the other units are hammering, sawing, and doing other kinds of noisy work.
3. Difficulty of handling four distinct type-groups of work in the same room, at the same time, by one teacher.
4. Multiplicity of tools, equipment, and supplies to be kept up.
5. Increased number of preparations for the teacher.
6. "Junk shop" atmosphere rather than that of any one industry.  

Position of the General Shop Philosophy. William E. Roberts in his study of manual arts in the junior high schools reported:

The general shop as a factor in manual arts is certainly in the experimental stage, with ample reasons for questioning its value where conditions made possible a different type of organization. . . . The prevailing impression of work in the general shop is one of confusion,

36 Ibid.
disorder, and waste of material and equipment and of time and energy on the part of both pupils and teachers. 37

In spite of the multilateral viewpoints associated with the general shop, its popularity rapidly increased during the 1920's, especially in junior high schools located in communities with small populations. There were two basic reasons for this. First, since the junior high school was considered to be an exploratory experience for the student, it was felt that a youngster could more readily explore in one large laboratory comprised of materials, tools, and equipment representative of many industries. Second, many school systems could not afford unit shops for each major area of study and consequently felt that the comprehensive general shop was the most practical solution to the economic problem. The general shop was also advocated by educators who argued that the general shop facility would prevent the vocational-type programs encountered in many unit shops.

Percy Angrove, State Supervisor of Manual Arts in Lansing, Michigan, at the time wrote:

The general or composite shop idea is being accepted quite generally in many of our progressive cities of medium size as well as in our smaller communities. In fact, there is a question as to whether or not it is possible

37 Roberts, p. 12.
to have successful tryout shop courses in the high school, without previously having allowed the pupils to have an extensive rather than intensive period of exploration in the intermediate grades. 38

Household Mechanics

Many attempts were made to broaden and enrich the manual arts subjects in the 1920's. One definite consequence of this activity was the growth of a program called, among other things, household mechanics. There appear to be a number of reasons for the growth of this subject whose name at times was used to identify the entire field of manual training. First, increasing attacks on the value of manual training as a general education subject prompted supporters to assume defensive positions while attempting to justify, superficially at times, the place of their subject. One product of this justification was a comprehensive subject designed to give students an understanding of products and materials utilized in the home; this subject was called household mechanics.

Early Beginnings. Although in the 1920's household mechanics was a popular term used to describe a multiple activity type of shop program, the idea originated in Eau Claire, Wisconsin, in 1908.

As a result of the work of E. H. Harlacher, a graduate of the Stout Institute at Menomonie, it soon grew in popularity and approximately five years later was a firmly established course in the Detroit elementary schools. By the middle 1920's "every boy in Detroit... received instruction in household mechanics." 39

Although Harlacher is given credit for the initiation of home mechanics in the school system, the program spread as a result of Fred L. Curran and his work on the higher education level at the Stout Institute. Probably the man primarily responsible for the spread of the program to the large cities was J. H. Trybom, Director of Industrial Education in the Detroit Schools. 40

**Status and Content.** In the early 1920's home mechanics courses were gaining popularity. C. A. Bowman and F. E. Justison of the Stout Institute described four particular situations in which home mechanics was being emphasized:

... first, as the small town's solution of the junior high school industrial-arts philosophy; second, as a means of providing shopwork for students in junior high schools in the larger cities not particularly in the industrial group;


third, as one form of shop in which a variety of occupational work may be represented in the school in the larger city where it does not seem feasible to have a number of single activity shops; and fourth, it is being used in some places as the shopwork to give the part-time pupil in the vocational school who comes without any basis for intelligent choosing of occupational work. 41

As the popularity of the household mechanics program spread, so did confusion regarding it. Under the guise of household mechanics, almost every shop activity was justified. A superficial review of many programs reveals a theoretically ideal situation; however, a more intensive investigation indicates a thoroughly confused state of existence. Trybom described an operational program stating its purpose as giving to the "boy a thorough [sic] knowledge of the use and maintenance of the various household appliances, involving various kinds of repairs, so as to secure efficient use of these appliances." The following twenty-five units composed the contents of this course: building materials, building construction, the city building code, sharpening tools, soldering, glazing, nails and screws, paints and varnishers, locks, hinges, furniture repair, the water supply, the range boiler, faucets, traps, flush tank, electric bells, house wiring,

41C. A. Bowman and F. E. Justison, "Home Mechanics Instruction at Stout," Industrial-Arts Magazine, XII, No. 12 (December, 1923), 454.
heating by electricity, motors, fuel, hot-air-furnace, steam-heating plant, hot-water heating plant, refrigerator.\textsuperscript{42}

Household mechanics became a term to denote a kind of general shop as the decade progressed. E. L. Shoenike, an instructor of home mechanics in Wisconsin, and Roy R. VanDuzee, a supervisor of industrial arts in Wisconsin, wrote:

\begin{quote}
Widespread adoption of the general-shop idea in the teaching of industrial-arts activities by the schools throughout the country has been very rapid. . . . The teaching of the several kinds of work simultaneously amounts to the conducting of several classes or groups at the same time and, therefore, requires a different teaching technique than has been employed in the teaching of a traditional shop class. Home-mechanics teaching due to the unusually large range of tools and materials used is one of the general shop courses, which if taught effectively, requires careful planning as to selection of content, shop organization, and methods of teaching.\textsuperscript{43}
\end{quote}

By the end of the decade, household mechanics and its related terms were used as synonyms for the manual education subjects.

The Dalton Plan of Education

One of the principal experimental programs implemented in American schools during the third decade of this century was the


\textsuperscript{43}E. L. Schoenike and Roy R. VanDuzee, "The Teaching of Home Mechanics," \textit{Industrial Arts and Vocational Education}, XIX, No. 6 (June, 1930), 205.
Dalton Plan of Education, also referred to as the Dalton Laboratory Plan. Basically, the plan was a reaction to the constricting and formal progression of learning which was characteristic of schools not only of that period but of schools throughout history. Helen Parkhurst, Education Director, Children's University School, described the plan primarily as a way whereby culture and experience "can be reconciled and achieved." The plan featured two principles: freedom to study, under a counselled plan, any subject at any time, and co-operation or "interaction of group life." 44

Under the Dalton Plan there were no classes as such; students were free to work in any classroom or laboratory providing that specific preparatory work was completed prior to class attendance. Once in the classroom, each student would generally work on problems related to his particular level of study while waiting to recite for the teacher. U. D. Walker from Chester, West Virginia, described a day's schedule in the Demonstration High School of West Virginia University:

7:45-8:00 a.m. -- A fifteen-minute period used as a general assembly for taking roll and making announcements.
8:00-10:45 -- This is used as a "workshop" period, that is, the pupils during this period are free to go to any of the rooms representing the different subjects, to work on their contracts.

10:45-11:00--General assembly period for taking roll and making announcements. Final general assembly of the day.

Beginning at 11 o'clock, the remainder of the day is divided into 30-minute periods with the exception of the noon hour. 45

Education under the Dalton Plan was characterized by individual student programs of study or "contracts." The manual arts educators of the period pointed to the similarity of these plans to the work sheets already employed in the teaching of shop subjects. However, in practice, the Dalton Plan contracts differed radically from the industrial education work sheets or plans in that the former were generally developed with a specific student in mind while the latter were used as a method to complete a specific project or experience required of the student.

There were both advantages and disadvantages in this system when applied to the teaching of industrial arts. One definite advantage was the opportunity each instructor had to call group "conferences" with any students he desired. Thus, when a number of boys were ready for a demonstration, the instructor could summon these students regardless of class standing. Under the regular system, the teacher would generally have to repeat a single lesson for every

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class he taught. Another reported advantage was the diminishing discipline problem due to the interest on the part of each student in his own work and rate of progress.

While the advantages of the Dalton Plan appeared to be potentially promising, there were disadvantages which were to result in abandonment of the plan. An outstanding disadvantage was the lack of control school administrators had regarding the student distribution at any given time of day. Consequently, the more popular classes would often be overcrowded while other classrooms were comparatively empty. One problem specific to industrial arts teachers resulted from the lack of control over tools and materials. With pupils entering and leaving a room at various times of day, it was extremely difficult to account for tools and materials.

Walker perhaps best summarized the feelings of industrial arts educators regarding the Dalton Plan when he wrote:

I do not see that it is going to make a great deal of difference whether manual arts is taught according to the old method or the Dalton Plan, so far as results are concerned. I do not feel that any shop teacher need worry about the results if the Dalton Plan is introduced into his school. If he makes his work really interesting and worthwhile, the majority of students will spend more than the necessary amount of time in the shop. 46

46 Ibid., p. 284.
New Organizations Arise

**American Vocational Association.** In 1926 the American Vocational Association, an organization to have a substantial influence on industrial arts education in years to come, was formed as a result of a merger between the National Society for Vocational Education and the Vocational Education Association of the Middle West. The new organization's structure was designed so that specific fields of practical education would each be represented through a vice president.

The constitutional purposes of the American Vocational Association were:

To establish and maintain active national leadership in the promotion of all types of vocational and industrial arts education, including guidance services and directed work experience for youth and adults.

To encourage further development of programs of education related to vocational education, including industrial and other forms of practical arts.\(^{47}\)

The specific objectives of the association were primarily vocational in nature, even though many of its early members were industrial arts educators. Layton S. Hawkins, Charles A. Prosser, and John C. Wright, leading figures in the vocational education movement, stated the following four as major objectives:

1. To assume and maintain active national leadership in the promotion of vocational education.
2. To render service to state or local committees in stabilizing and promoting vocational education.
3. To provide an open forum for the discussion of all questions involved in vocational education.
4. To unite all the vocational education interests of the country through membership representative of the entire country.48

The official publication of the American Vocational Association was the *American Vocational Association News Bulletin*. Published originally as a newsletter designed to keep its members informed, the publication soon grew in stature and size. The name was subsequently changed twice, first to the *American Vocational Association Journal and News Bulletin* and then to the present title of *American Vocational Journal*.

By the close of the third decade, the association had a membership of more than 7,000 individuals interested in vocational and industrial arts education. This was an increase of more than threefold from its original membership of 1,222 members.49

**Epsilon Pi Tau.** Toward the end of the decade, Epsilon Pi Tau, an organization which was to exert a strong influence on the industrial arts profession in the thirties and forties, was founded at The Ohio State University under the leadership of William E.

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49 Roy B. Fales, "50 Years of Progress in Industrial Arts Education," *American Vocational Journal*, XXXI, No. 9 (December, 1956), 94.
Warner. Organized to develop "leadership through the recognition and fostering of technical skill, social competency, and research," the fraternity soon established chapters in many of the industrial arts teacher education institutions throughout the country.\textsuperscript{50}

Although Epsilon Pi Tau was originally comprised of graduate students at The Ohio State University, it soon included nationally and internationally prominent men in industrial arts and vocational education. Through the Laureate Citation, the fraternity's highest honor, such men as Frederick Bonser have been recognized.

Teacher Education

One of the major difficulties directly affecting industrial arts in the early 1920's resulted from the vocational background of the majority of industrial arts teachers. Arthur F. Payne attributed this difficulty to

\ldots the fact that we are attempting to take persons trained in production, such as expert machinists, milliners, carpenters, draftsmen, electricians, dressmakers, etc., and make them over into practitioners of teaching, which is an entirely distinct vocation from any one of these productive vocations.\textsuperscript{51}

\textsuperscript{50}Ibid., p. 81.

Payne indicated that an expert in an industrial occupation had achieved his level of performance by methods not necessarily suited for the general education of school youth. He illustrated the main difference between a professionally trained teacher and a teacher by virtue of his trade experience as being subjective and objective and felt that the expert worker could not help but be objective in his teaching since his background was one of objective trade learning. The worker had attained his level of performance by constant practice with tools and materials; his economic survival depended on the specific mastery of the trade.

**Exemplary Programs.** Industrial arts teacher preparation in the twenties consisted of differing programs, depending mainly on the background of the student and the preparing institution. H. F. Good, E. J. Neary, and C. A. Bowman of the Stout Institute, one of the leading higher educational institutions in the preparation of industrial educators, described the program for teacher preparation in which industrial arts teachers and vocational teachers were trained. At that time there were basically three different groups of individuals registered in the teacher education program which varied in length from two to four years depending on the vocational objective of the student. First, there were students who enrolled at Stout immediately after completing their secondary school educa-
tion. Secondly, there were individuals who had completed their secondary school work a few years before registering and who had worked in some occupation in the interim period. Finally, there was a group of students who had completed work as journeymen, having had two years of trade experience beyond the period of apprenticeship and who, in addition, were recommended by the State Board of Vocational Education.

In 1923 Stout Institute offered twenty-one courses in different industrial work. A student was further allowed to modify his program so that additional combinations of work were possible. Stout at that time prepared industrial educators for three different occupations. The ultimate teaching position was determined by the student's initial qualifications. For example, the students from the first group mentioned above would qualify for positions in the junior high and senior high schools, the second group would qualify for positions in the junior and senior high schools and in the vocational schools, while the journeymen could qualify only for positions in vocational schools.

William E. Warner, an associate professor of industrial arts education at The Ohio State University, citing reactions to existing teacher education programs gathered by Fred Strickler, an instructor at Teachers College, wrote that the "experienced teacher
generally recommends only those courses for the preparation of a new teacher which are of practical or immediate use to him." The technical courses most frequently recommended by these teachers were "mechanical drawing, bench woodwork, cabinet making, wood turning, machine drawing, machine shop practice, architectural drawing, and sheet metal."52

While teacher education programs during the 1920's appeared to keep abreast of most of the new developments in industrial arts, there was a deficiency in the preparation of the general shop teacher. Harry E. Wood, Director of Vocational Education and Manual Training in Indianapolis, described the situation in an article written in 1927:

The general shop to be a real asset in the educational program must have excellent teachers, teachers of initiative, teachers who have a wide range of experience in a variety of crafts, teachers who can apply their technical skill in an elementary way in the construction of projects adapted to pupils of varying abilities and interests. The normal schools and colleges have not been able to cope with this new situation in supplying good general-shop teachers in sufficient numbers to meet the need. As a result many communities have not yet organized their work on a general-shop basis for fear of not being able to hire good teachers after the organization is complete.53

52William E. Warner, Policies in Industrial Arts Education (Columbus: The Ohio State University Press, 1928), p. 46.

Vocational Experience Versus General Education. One outstanding controversy regarding the preparation of teachers evolved from the stress placed on vocational experience. Many educators emphasized the importance of such experience in the teaching of industrial arts subjects while others professed the importance of a sound teacher preparation experience. Lynn E. Stockwell of the Trade and Industrial Department, College of Education, University of Minnesota, indicated that Salomon, in his book Theory of Educational Sloyd, wrote of the failure as teachers of the highly skilled artisans when manual training was introduced into the Swedish schools. Stockwell further wrote of the inadequacy of skilled tradesman as teachers during the period of the World War which necessitated the hiring of skilled workers rather than prepared teachers. The teacher preparation program at Stout strongly discouraged skilled tradesmen without an adequate general education background from obtaining teaching positions in non-vocational high schools.

Additional Highlights

Art and Industrial Arts. With the increasing availability of consumer goods in the twenties, there was concern regarding

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the loss of aesthetic appreciation for products. Consequently the importance of art and design in the industrial arts program became somewhat of a controversial issue. Charles DeGarmo and L. L. Winslow, Specialist in Drawing and Industrial Training, State Education Department, Albany, New York, expressed a popular concern when they stressed:

To the modern household the selection and arrangement of manufactured products in the home is of the utmost importance, and it is, therefore, with the setting up of esthetic [sic] ideals and the judging of products with reference to these that the household is primarily concerned. 55

The place of art in the school curriculum and its relation to the study of industry was a major topic of discussion at many national and local industrial and manual art association gatherings. It is apparent from the literature of the period that the word art in industrial arts reflected the literal sense of the word and strongly promoted the principles of the arts and crafts movement. There were a number of educators who were concerned about the lack of art in industrial products and consequently stressed the importance of design and drawing in industrial education. These individuals placed importance on the word art as opposed to others who stressed the word industrial.

When a review of the reading material is made, industrial art very frequently identifies the art in industry and excludes the term as a title for a school subject. One illustrative example of the former use of the term identifies Richard F. Bach as an associate in industrial arts, Metropolitan Museum of Art, New York City.

Bach, comparing and contrasting fine and industrial arts wrote that they "are part of the same chain of reasoning; they require the same kind of thinking; they spring from the same roots; and what is more, those that we now call fine have always until this sophisticated day--really been industrial." Bach went on to indicate that while perhaps the art of painting did not utilize machines, "there are many other arts, metal, furniture, textiles, that do lend themselves in part to machine production without loss of artistic character."56

Part-Time School Programs. Accompanying the compulsory education statutes which extended the legal tenure of students was an increasing need for educating those students who did not wish to continue their schooling beyond the minimum period. Due to the importance of this problem, there developed a program of schooling

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which allowed the student to attend school on a part-time basis while employed.

The part-time or continuation school, specifically designed to meet the needs of the school dropouts, was a reality by the early 1920's. Though criticized and praised by various individuals and groups, the continuation school was primarily serving the student whose immediate objectives were vocational. Strongly emphasized in the continuation school programs were the industrial arts whose pre-vocational and vocational objectives were used to justify the heavy concentration. Consequently, the manual training subjects and the continuation program were popular topics for discussion among industrial educators of the period.

Many educators and administrators, while favorably inclined toward the ideal and intent of the continuation program, deplored the real deficiencies which existed in the program. Because of the popularity of the manual arts subjects, it was not uncommon to find manual arts educators commenting on the part-time school and its program. Arthur Dean, an editor of the Manual Training Magazine and professor at Teachers College, Columbia University, strongly criticized the manual arts subjects in the continuation school. He wrote of the part-time schools that theoretically "they offer bread and wine" but "practically and generally speaking, they
give stones and water."\textsuperscript{57}

Arthur B. Mays wrote of the part-time school as being an industrial school in that it served primarily the youth already engaged in industrial pursuits. However, he stressed that this did not mean the part-time program was a vocational program; he strongly indicated that its purpose was one of general education.\textsuperscript{58}

**Projects and Exhibitions.** Perhaps the most glaring dichotomy existing in industrial arts education during the twenties and for many years thereafter was the theoretical emphasis on the student but an actual emphasis on the completed product. While industrial arts advocates openly spoke of the truly educational values of the subject, the evaluation of student growth and learning seemed to come basically from the quality of the completed project.

Illustrating this dichotomy in the 1920's was the annual project exhibition with the accompanying prizes for outstanding projects. S. M. Dell, from Marion High School, Marion, Kansas, in a descriptive article published in a leading industrial arts periodical in 1928, defined a contest including the competitions involving


shop projects as an activity "striving for some goal where the motivating factor is of secondary importance to the knowledge gained in securing this goal." He further defined exhibits as the "submitting in public or private, of the finished project for approval."\(^{59}\)

Dell discussed some of the "most fundamental objectives of industrial arts contests." He pointed out that exhibits and contests created a greater interest in industrial arts, promoted a higher standard of workmanship and stimulated originality. One glaring contradiction regarding the stimulation of originality is apparent from Dell's article, for in his accompanying photographs are rows upon rows of almost identical or standard projects seemingly devoid of any originality.

The following editorial comment perhaps best describes the image manual training received from project exhibitions:

There are evidences in every convention exhibit that the old-fashioned manual training is still struggling to survive. One can still see rows of sleeve boards, coat hangers, book racks, and foot stools of exactly the same dimensions and designs that we of the older generation used as "models" twenty-five or thirty years ago.\(^{60}\)

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Committee on Standards

Toward the end of the 1920's, there was a strongly increasing concern among industrial educators regarding the overlapping and sometimes contradictory proposals, aims, and content of industrial arts courses. The concern reached a climax in 1927, and at the December convention of the recently formed American Vocational Association a group of individuals with a special interest in industrial arts petitioned the Executive Committee of the association to appoint an official committee, consisting of active educators, administrators, and other leaders in the field, to discuss and further study many of the problems pertaining to industrial arts. As a result, the Committee on Standards of Attainment in Industrial Arts Teaching was appointed by R. L. Cooley, President of the American Vocational Association.

There were seven original members on the committee which was chaired by Emanuel E. Ericson, State Teachers College, Santa Barbara, California. In addition to Ericson, the members were: Charles F. Bauder, Board of Education, Philadelphia; William T. Bawden, Industrial Education Magazine, Peoria, Illinois; Clyde A. Bowman, Stout Institute, Menomonie, Wisconsin; Maris M. Proffitt, United States Office of Education, Washington, D. C.; William E.
Roberts, Board of Education, Cleveland, Ohio; and Robert W. Selvidge, University of Missouri, Columbia, Missouri.

The members of the committee were given no exact assignment by the governing organization but instead were encouraged to approach the solution of the many problems in the field as the members' experience and wisdom dictated. After soliciting and reviewing numerous suggestions, the committee decided to focus its work on "a study of those things which the boy should know and be able to do, in the field of industrial arts, by the close of the junior high school period." After further consultation with leaders in the field, six units of "related knowledge" were decided upon. These included woodwork, household mechanics, electricity, sheet metalwork, printing, and automechanics. ⁶¹

The American Vocational Association's Committee on Standards had been working for almost two years by the end of 1929. At the December, 1929, American Vocational Association Convention, a progress report on the committee's work was officially presented. Included in this report were the results of a questionnaire sent to industrial arts administrators in forty cities investigating the existing content in each of the six previously mentioned industrial arts areas.

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⁶¹American Vocational Association Committee on Standards of Attainment in Industrial-Arts Teaching, p. 263.
Seven suggested uses for the results were specified by the committee:

1. Representing the consensus of a large number of teachers and supervisors, rather than merely a summary of present practice, this report will serve as a basis upon which to organize, or by which to judge, a program of industrial arts for the junior high school period.

2. These outlines may be used by the administration in an individual school, or school system, to assist in giving more definite assignments to shop teachers.

3. These outlines serve as a practical demonstration of the genuine content values of industrial-arts activities.

4. These outlines may be used by shop teachers to check the projects which have been selected or assigned for teaching, to determine whether they include the units of instruction which are to be covered.

5. These outlines may be used by the Industrial-Arts Department to check all those construction and repair jobs which are so often thrust upon the school shop without regard to the teaching program.

6. These outlines may be used to adjust any given line of industrial arts work to varying amounts of time available, by increasing or decreasing the number of units according to the time allotment, substantially in accordance with the order of importance suggested.

7. These outlines may be used as a basis for estimating the amount and character of equipment and supplies required for a given number of students. 62

With this report the Committee on Standards obtained extensive material which was to be used in the following decade in an attempt to clarify much of the confusion existing in the study of industrial arts.

62 Ibid.
Summary

The start of the third decade of the twentieth century found the manual training subjects obscured by the vocational education movement. Three terms were used to identify the area of study whose principal objectives were of a general education nature: manual training, manual arts, and industrial arts. But however under-emphasized and confused were the manual training subjects, the decade saw growth and expansion, though not real clarification, in the field.

One of the strongholds of the manual training subjects existed on the elementary school level. Resulting from earlier influences and from the contemporary influence of Bonser and others, the subject enjoyed a central position in many educational programs. It was at this level of education that the name *industrial arts* was most prominently used.

The junior high school of the twenties was still in the experimental stage in many communities and was experiencing the growth problems associated with new programs of education. Widely accepted in the junior high schools, primarily for its exploratory values, was industrial arts. A much discussed industrial arts program in the junior high school was the general shop. Based on the promotion of
an exploration of numerous shop areas as opposed to a study in depth of a few areas, the general shop advocates supported the program from comprehensive and unit points of view. Perhaps the outstanding acceptance of the general shop, both as a program and as a facility, took place in the suburban schools which served a comparatively small number of students and which consequently could not justify the financial expenditures necessary to present a multi-shop industrial arts program.

Household mechanics was a popular comprehensive shop program in the twenties. Originating in 1908 the program grew under several names such as home mechanics. As the decade progressed, the popularity of the household mechanics program increased. Included in this study were all of the industrial arts areas until household mechanics became a catch-all phrase for varied shop work. By the end of the decade, the term was not only used synonymously with general shop but was sometimes used to identify the entire field of industrial arts.

One of the more promising experimental programs to affect the cross section of educational subjects in the twenties, including industrial arts, was the Dalton Plan of Education. However, though heralded by its advocates as the answer to many existing scholastic problems, the plan lost much favor by the end of the decade.
Perhaps the specific event which was to have a most profound influence on industrial arts in the decades to come was the formation of the American Vocational Association. The result of a merger of the National Society for Vocational Education and the Vocational Education Association of the Middle West, the move established one powerful organization for the purpose of the promotion of vocational education and related fields.

The place of art in the public school curriculums and its relation to industrial arts was another controversial highlight in the third decade of the twentieth century. Resulting from the increased use of machines in the manufacture of consumer products, there was much concern among educators and administrators regarding the aesthetic values of youth specifically and society in general.

With the increasing number of compulsory education laws, an ever larger number of youths attended school while employed on a part-time basis. To specifically meet the needs of this group, the part-time or continuation school was developed. Although the success of this program was disputed, industrial arts played a prominent part in the curriculum.

The end of the decade found an increasing demand from educators and administrators for some standardization of industrial arts objectives, content, and methods. Called upon to investigate
the existing problems and to propose feasible solutions was the American Vocational Association. The immediate consequence was the formation of the Committee on Standards of Attainment in Industrial Arts Teaching. The close of the decade found this committee functioning vigorously.
CHAPTER IV

INDUSTRIAL ARTS IN THE 1930's

The fourth decade of this century found the manual training subjects in a continued state of confusion. At this time the term manual training was giving way to the name industrial arts as the terminology most commonly used to identify general education shop work. But despite the unsettled state of the discipline, there seemed to be much cause for optimism among industrial arts educators and administrators. In the preceding decade, the manual training subjects were generally well received in the elementary school programs. Initial industrial arts programs in the experimental junior high schools appeared to be quite successful and served to meet the varied needs of youth. Many professional surveys, while admitting to the confusion existing in the field, cited much growth in industrial arts subjects.

The Depression Years

The 1930's vividly reflected the extent of the depression which began just prior to the decade. This was a period of pronounced
school curriculum scrutiny and revision in an attempt to eliminate all subjects which did not contribute to the general education, and in some cases vocational education, objectives. It was perhaps during this period that industrial arts underwent one of its severest tests of recognition and placement in the school curriculum.

Starting with the final years of the third decade and continuing through the first half of the fourth decade, the threat of abandonment of industrial arts in public school curriculums was frequently heard. Perhaps representative of the emotion and alarm involved was an article written by Frederick J. Moffitt, Superintendent of Schools in a New York community:

The gauntlet has been thrown to the teacher of industrial arts. There is a challenge in the air. In thousands of communities suffering from severe financial strictures the cry has arisen to cut down educational expenditures. The schools, versed in political expediencies and stratagems, have had to accept the full force of an economic depression. The accusation of "frills and fads" in education has been taken up by minority groups of taxpayers' associations and economic councils. Education is facing a continued curtailment that seems to many neither wise nor necessary.¹

Although the depression did not eliminate many industrial arts programs from the curriculums, it did cause many industrial arts educators to re-examine their programs with a view toward

¹Frederick J. Moffitt, "Interpreting the Industrial Arts," Industrial Arts and Vocational Education, XXIII, No. 3 (March, 1934), 116-19.
eliminating any questionable content. Objectives were re-evaluated; the work of the American Vocational Association's Committee on Standards of Attainment in Industrial Arts Teaching was widely publicized and used.

To provide the industrial arts teacher with concrete information should preparing a defense for his subject become necessary, a number of articles appeared in industrial education periodicals. Perhaps one of the most comprehensive of these was an article written in 1933 by William T. Bawden of the Industrial Education Magazine. In addition to providing readers with a bibliography of resource articles, Bawden listed the objectives of each industrial arts area of study as they had been written by leaders in the various fields.²

**Effects of the Depression.** Although the depression did cause much examination of industrial arts material and content, subsequent educational studies revealed favorable findings regarding the curriculum area. One such study was undertaken by the United States Office of Education in the early 1930's; the results were published under the title of The National Survey of Secondary Education. In a review of this report, Bawden focused attention on a number of

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findings immediately significant to industrial arts educators. Regarding the junior high school, Bawden found that the relative prominence in the total offerings of the different subject groups has undergone considerable change, the tendency being for the non-academic subjects to gain at the expense of the academic subjects. Thus relative gains are noted for fine and industrial arts, commercial subjects, and physical education. 3

Still regarding the junior high school, Bawden found increasing time allocations devoted to the "social-integrative activities" such as auditorium and club activities.

Regarding high school curriculums, Bawden cited four significant trends during the preceding twenty-five year period: (1) "a rapid increase in the number of different and more or less distinctive curriculums offered," (2) a proportional decrease in the college preparatory curriculum with "commercial, industrial-arts, household arts, and other curriculums" achieving numerical dominance, (3) a doubling of the number of different courses offered during the last twenty-five years, and (4) the curriculum areas experiencing the "largest proportionate increments" were "English, the social studies, commercial, industrial arts, household arts, fine arts, physical edu-

cation." The areas showing the smallest growth were "science, mathematics, and foreign language."\(^4\)

The junior high school was a relatively established American educational institution by the fourth decade. Although the topic of much discussion in the 1920's, the intermediate school program was now accepted by most laymen and educators. One basic area in the junior high school curriculum was industrial arts. Though chiefly an experimental offering in the twenties, by 1930 industrial arts was regarded as an integral part of the total offering of a junior high school program designed to orient adolescent youth through the medium of a number of worth-while manipulative experiences, in addition to the more formal study of textbooks and the hearing of lectures in other fields of subject-matter.\(^5\)

A comparative study of industrial arts before and after the depression was made by Arthur Feuerstein, Head of the Department of Industrial Arts, Rogers Junior High School in Stamford, Connecticut. The initial part of the survey was comprised of eight questions asked of representatives from thirty-two different school systems during the height of prosperity in the 1920's. Feuerstein's questions inquired about: (1) population of city, (2) number of industrial arts

\(^4\)Ibid.

teachers employed by the system, (3) grades in which industrial arts instruction was given, (4) weekly time allotment for industrial arts, (5) industrial arts subjects taught, (6) total cost of industrial arts program operation, (7) total cost of shop operation, and (8) importance of industrial arts as a subject. 6

In 1935 Feuerstein ran an identical survey, submitting the same questions to the same school systems. With a return of better than eighty-seven percent, the study confirmed the fact that the depression did not have as adverse an effect on industrial arts teaching as was believed by some educators. Some of Feuerstein's findings indicated: (1) More schools increased rather than decreased the weekly time allotment devoted to industrial arts. No school system reported a total curtailment of industrial arts programs. (2) On the whole, more teachers were reported teaching industrial arts subjects in 1935 than in 1927. (3) A significant majority, fourteen out of the reporting twenty-eight school systems, indicated that the importance of industrial arts in the school curriculum was increasing.

Early in the 1930's the New York State Vocational Association started publication of a series of monographs on topics of current

6 Arthur Feuerstein, "What Has the Depression Done to Industrial Arts Education?" Industrial Education Magazine, XXXIX, No. 4 (September, 1939), 173-77.
interest to industrial arts and vocational educators. The first monograph of this series was devoted exclusively to "various phases of industrial arts education." Richard Piez of the State Normal School at Oswego, New York, discussed the educational value of industrial changes in the American society and, like other educators before him, indicated that the schools must supply occupations and activities which the home no longer supplies. The most important of these is the construction of objects and of drawing, for only through these can the child acquire the knowledge and mastery of form which enable him to understand the thought expressed by its maker, and so to progress from a fumbler with industrial products to an intelligent user of them.\(^7\)

The position of industrial arts in the school curriculum was such that enrollment in this area surpassed the enrollment of any other industrial education subject by the middle of the 1930's. In 1933 a survey conducted by the Buffalo, New York, public school system in an attempt to determine current industrial arts practice in the United States revealed woodworking to be the most popular course offering in three of the largest cities; electricity, household mechanics, and mechanical drawing were second in popularity each leading in one reporting city. The most popular projects were those which, in general, had practical use. A summarizing statement suggested

"that [student] interest is likely to be greater in the general than in
the unit shops, but quality of work much inferior. This is only nat-
ural, due to the shorter time devoted to any one type of work."\[^8\]

The Selvidge Plan

Robert W. Selvidge from the University of Missouri in 1929
outlined a program of industrial arts based on desired outcomes iden-
tified through an analysis of general education objectives. He strongly
indicated that the need for emphasizing things to be taught rather
than things to be made was necessary in order to reach the objectives
outlined. He felt that the general objectives of industrial arts would
be realized if the program prepared students who had "a well-devel-
oped interest in industrial affairs" which he felt could easily be ac-
complished if industry were studied from the standpoint of

(a) The source of the raw material and the methods of
preparing it for use.
(b) The durability and adaptability of the material for
particular uses.
(c) The working qualities and characteristics of the
materials.
(d) The commercial sizes, grades, classifications,
and sales units.\[^9\]

\[^8\]Ralph D. Fleming, "Industrial-Arts Practice in Nine Large

\[^9\]R. W. Selvidge, "What Shall We Teach," Industrial Educa-
tion Magazine, XXXI, No. 2 (August, 1929), 43-45.
Selvidge further reasoned that industrial interests could readily be developed if industrial processes and materials were stressed rather than specific technical information. This would further give students

A knowledge of some of the elementary principles of science that affect the functioning of the things we use.  
An appreciation of good workmanship and good design.  
An attitude of pride or interest in his ability to do things.  
A feeling of self-reliance or confidence in his ability to take care of himself in an unusual situation.  
A habit of orderly and methodical procedure in the performance of any task.  
Elementary skills in the use of the more common tools and machines and in methods of modifying and handling materials, in order to make them conform to our use.  

Selvidge felt that there were two important steps in the development of a skill. The first of these was the knowledge of "how to do a thing," while the second was the ability of doing it "effectively." Selvidge indicated that the industrial arts profession should be primarily interested in the former step while the latter should be determined by the vocational goals of the student. In choosing the materials with which to work, Selvidge felt that the important measure was "Does the [material] afford the best available opportunity to teach the things we wish to teach?"  

10 Ibid.  
11 Ibid.
The Selvidge Plan was to become one of the basic guides on which much future industrial arts work was to be based. If one word could have been descriptively associated with the Selvidge Plan, this word was analysis which Homer J. Smith, Professor of Industrial Education, University of Minnesota, defined as

A process of separating something into its component or constituent parts, with a definite purpose in view. It involves, further, the understanding of these elements with relation to each other and to the total pattern. In our branch of the profession we think of "analysis" as a noun. We make an analysis rather than an analysis record.\textsuperscript{12}

Although analysis was prominent in the Selvidge Plan, it was necessarily supported by many subordinate principles. The success of the Selvidge Plan depended a great deal upon the ability to reason. Verne C. Fryklund of the University of Minnesota, writing on the Selvidge Plan at the turn of the decade, recognized five hypotheses regarding reasoning:

1. reasoning is of great significance, and is required for progress in school and in the world outside.
2. adequate experiences are necessary because reasoning does not evolve thru \[\text{sic}\] a passive existence.
3. experiences must be accompanied by problem-solving attitudes.

\textsuperscript{12}Homer J. Smith, "Four Important Terms," Industrial Education Magazine, XL, No. 5 (November, 1938), 226.
4. the means of accomplishment for developing reasoning abilities is thru an adequate method that provides adequate experience.
5. such methods should be provided for children as well as for adults.  

Since experience was an important factor in the process of reasoning, the Selvidge Plan was basically manifested in an ordered series of problem-solving tasks based on job analyses consisting of unit operations. Selvidge divided the study of each major subject of industrial arts into three principal groups:

"The Things You Should Be Able To Do," "The Things You Should Know," and "The Things You Should Be." The first group involves manipulative skill, knowledge of procedure, and construction processes. The second group involves information concerning qualities and characteristics of materials, and other matters of general interest in the field. The third group involves attitudes and habits which affect the success of individuals. They probably are the same for all subjects.  

One of the basic features of the Selvidge Plan was that the series of operations employed in the completion of a job, commonly thought of as a project, was but an incidental result of the experience; the operation was something which would be utilized in subsequent experiences. Compared to mathematics, the job was analogous to

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the problem "composed of a number of manipulative processes in combinations." The processes were analogous to operations.

One immediate result of the Selvidge Plan was an increased interest in the plan of procedure, more commonly referred to as the job plan. Basically, the job plan was a statement of the problem to be undertaken by the student with the accompanying steps toward the solution of the problem. The structure of a feasible work plan was directly dependent upon two things: first, the student's past experience with the tools, materials and processes involved and, second, the student's ability to analyze which was in turn dependent on the student's ability to reason.

While the original purpose of the plan of procedure was to "provide a means by which the teacher may know how well the learner has thought through his job," the method was used by many educators as a means of simplifying the teaching task. Instead of guiding the student through the sometimes difficult steps of plan development, the teacher developed a plan of procedure and distributed it when he felt the students were ready for it. While originally a sound approach to the study of industrial arts, the standard use of the plan of

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15 Verne C. Fryklund, "The Plan of Procedure," Industrial Arts and Vocational Education, XX, No. 3 (March, 1931), 78.

16 Ibid., p. 77.
procedure was to become one of the controversial points in the industrial arts program.

A Decade of Clarification

The confusion relating to the manual training subjects, increasing steadily during the 1910's and 1920's, came to a climax with the formation of the American Vocational Association's Committee on Standards of Attainment in Industrial Arts Teaching in 1928. The attempt to interpret industrial arts continued into the thirties, and during the fourth decade no fewer than five major studies and plans were defined in an attempt to clarify the existing confusion.

Committee on Standards. In 1928, due to the demand on the part of many industrial education teachers and administrators, the American Vocational Association established a committee, consisting of leading educators, administrators, and personnel in the field of industrial education, to study the possibility of formulating a set of commonly accepted standards regarding industrial arts education as it was then being taught. Called the Committee on Standards of Attainment in Industrial Arts Teaching, the group attempted to get the cooperation of every industrial educator in the country. The
attempt to involve the largest number of people possible resulted in
the publication, printed on numerous occasions in the leading in-
dustrial education journals of the time, of the following proposal;

1. Every teacher who is interested in such an
   analysis should join in this undertaking.
2. All industrial-arts subjects, as taught in the
   high school, are to be analyzed, for the learning units
   involved.
3. That the principal skilled trades are to be
   analyzed for the learning units involved.
4. Tentative analyses of the selected subjects, or
   trades, are to be published and distributed as rapidly
   as may seem practicable.
5. Any shop teacher or supervisor who is willing
   to cooperate, or to offer suggestions in the way of
   modifying, adding to, or taking from, the original
   list, should send such suggestions or comments to
   R. W. Selvidge, University of Missouri, Columbia,
   Missouri, or to William T. Bawden, Peoria, Illinois,
   chairman of the committee.
6. Suggestions thus received should be carefully
   studied, edited, and incorporated, as far as possible,
   into the original lists, and the revised lists published,
   together with the names of those who cooperate.
7. Those who are interested should send in the
   analysis of any subject, or trade, which they have
   prepared, and which may be used by the committee
   as the basis of the preliminary analysis. This form
   of cooperation will be of great value in getting more
   satisfactory preliminary lists of units. 17

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17American Vocational Association Committee on Standards of Attainment in Industrial Arts Teaching, "A Cooperative Study Fostered by the American Vocational Association Committee on Standards," Industrial Arts and Vocational Education, XX, No. 5 (May, 1931), 189.
The work of the committee had widespread effects on the profession. A city supervisor wrote:

When shop teachers apply the method of analysis suggested by the Committee, and, for the first time, discover just what a student is supposed to learn through the making of any given project, it is a revelation to most of them. There are still some shop teachers who do not know exactly what they are teaching.¹⁸

Subsequent findings and proposals of the committee were widely publicized and heralded. After four years of the committee's existence, Bawden expressed the feelings of many educators when he stated:

No committee of teachers in the field of industrial education or the manual arts has ever had a more favorable opportunity for enlisting the cooperation of workers. The distribution of the Committee's tentative suggestions, and requests for criticism, has been nationwide; indeed, international in extent. The response has been generous and stimulating, to the highest degree.¹⁹

After several intermediate committee meetings and reorganizations, the final report of the Committee on Standards was presented at the national American Vocational Association convention held in Pittsburgh in December, 1934. The report was a substantial one, consisting of ninety-two pages. Perhaps the outstanding feature of


¹⁹ Ibid., p. 89.
the report was its attempt to bring to the industrial arts teacher a set of standards, including specific material and examples, which could be readily applied by school educators and administrators.

In a statement on objectives the committee emphasized that

The primary purpose of education is to develop our young people into happy useful, and successful citizens. It is toward the development of these that the efforts of industrial arts educators must be directed. The whole purpose of our activities as teachers is to work these favorable changes in the individual pupil, and to do it in the most effective and economical way. 20

The committee indicated that industrial arts was not necessarily the only curriculum area which could provide "experiences so effective in developing the attitudes and habits which contribute to 'Worthy use of leisure,' 'Worthy home membership,' or 'Vocational interests,'" but emphasized that industrial arts afforded experiences more effective in obtaining the objectives of general education "than the experiences offered in academic subjects." 21

The committee referred to objectives in industrial arts as "teacher objectives and not as the objectives of industrial arts or


21 Ibid., p. 9.
of general education." To this end twelve specific teacher objectives were listed:

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

2. To develop in each pupil the ability to select 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 work.

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 pupil an attitude of readiness to assist others when they need help and to join in group undertakings (cooperation).

10. To develop in each pupil 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 his ideas by means of a 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.\textsuperscript{22}

\textsuperscript{22}Ibid., p. 12.
Several units of learning were identified in the report: mechanical drawing, woodworking, elementary electricity, printing, automechanics, home mechanics, sheet-metalwork, cement and concrete work, machine shopwork, and forging. Each of these units was further divided into three major sections based on the Selvidge Plan: (1) The Things You Should Be Able to Do, (2) The Things You Should Know, and (3) What You Should Be.

The acceptance of the committee's original report was overwhelming. Since its original printing, the report has been reprinted and revised a number of times and has been considered by many to be the standard for industrial arts teaching.

The Terminological Investigation. In the early 1930's a study was undertaken by the Western Arts Association in another attempt to clarify some of the terminological confusion existing in industrial arts education at the time. Strongly influenced by the Bonser philosophy, the findings of this group, published in a bulletin entitled The Terminological Investigation, defined industrial arts with a lengthy descriptive passage. The introductory statement of the definition identified industrial arts as

one of the Practical Arts, a form of general or non-vocational education, which provides learners with experiences, understandings, and appreciations of materials,
tools, processes, products and of the vocational conditions and requirements incident generally to the manufacturing and mechanical industries.\textsuperscript{23}

The desired results in industrial arts education were to be obtained "through design and construction of useful products" both of which were to be "supplemented by readings, investigations, discussions, films, visits, reports, and similar activities characteristic of youthful interests and aptitudes in things industrial!" The listed purposes of industrial arts were numerous and seemed to reflect quite clearly some of the confusion and multi-purpose claims made by many industrial arts educators of the time. The statement of purpose included

exploration, guidance, the development of avocational and vocational interests and aptitudes, specific manual abilities, desirable personal-social traits growing out of industrial experiences, ability to choose and use industrial products wisely, -- all coupled with the aesthetic relationships involved. \textsuperscript{24}

The Western Arts Association distinguished between the terms laboratory and shop, referring to the former as "more appropriate when the offering is provided upon an experimental or

\textsuperscript{23}Western Arts Association, The Terminological Investigation of Professional and Scientific Terms From the Literature of Vocational and Practical Arts Education (Indianapolis: The Western Arts Association, 1933), p. 27.

\textsuperscript{24}Ibid.
developmental basis, as is commonly done in the junior high schools." The latter term was deemed "more appropriate where the work is carried on rather upon the production or economic basis, as may be done in the senior high school."25

The Ohio Prospectus. In 1934, The Ohio Education Association and the Ohio State Department of Education sponsored a publication prepared by the State Committee on Coordination and Development of Industrial Arts Professional Interests in Ohio which reviewed "certain points which form the basis for developing Industrial Arts in our schools along valid lines." The Prospectus was prepared for "the progressive teacher, supervisor, administrator, board member, parent, and interested layman, all of whom are concerned with trends in the study of the industries for educational and social ends."26

The members of the state committee, largely responsible for the development of the Prospectus which was published in the same year in which the final report of the American Vocational Association's Committee on Standards was revealed, were Elmer W. Christy, Cincinnati; Frank C. Moore, Cleveland; William E. Warner,

25Ibid.

26Ohio, The State Committee on Coordination and Development, A Prospectus for Industrial Arts in Ohio, Sponsored by the Ohio Education Association and the Ohio State Department of Education (Columbus, Ohio, 1934), p. 5.
Columbus; and F. C. Whitcomb, Oxford (ex-officio). With the support and assistance of many influential industrial arts leaders, these educators and administrators attempted to present the liberal view regarding industrial arts and opposed the standards movement. Discussing the confusion existing over the subject of industrial arts, the Prospectus indicated that some groups have emphasized certain groups of subjects, others have tried to standardize what was taught, while still others, particularly in Industrial Arts, have tried to superimpose trade training on non-vocational groups. 27

The industrial arts were presented in the Prospectus by means of The Circle-Chart Analysis which consisted of four basic parts of rings. According to its authors, the outer rim of the circle chart suggests certain principal sources of the heritage of Industrial Arts. This leads directly into a set of professional objectives or formulations which, when broken down into their various meanings, or concepts, serve as specific criteria for controlling or evaluating whatever is selected and experienced as Industrial-Arts subject matter, all of which revolves about the pupil and naturally assumes a laboratory that is both adequately equipped and staffed. 28

The definition of industrial arts offered by the Prospectus was the one offered in the report of The Terminological Investigation in 1933.

28 Ibid., p. 16.
The Manual Arts Conference. One of the influential organizations affecting the industrial arts movements of the twenties and thirties was the Manual Arts Conference of the Mississippi Valley. Originating in 1909 with an initial membership of "twelve members invited by Bradley Polytechnic Institute," the Conference operated on an informal basis, meeting annually by invitation only until 1927.\textsuperscript{29} At that time, due to increased activity and enrollment, an official policy controlling conditions of membership was established.

By 1934 the membership of the conference consisted of sixty-five men from the twenty states of the Mississippi Valley. The professional breadth of these members may perhaps best be realized from a statement made by Dr. Selvidge at the twenty-fifth anniversary dinner in which he indicated that

Exclusive of magazine articles and editorials, which are too numerous to mention, and excluding duplications, 72 members and former members of the Manual Arts Conference have contributed a total of 295 titles, including books, printed bulletins, and reports. It is doubtful if any comparable group of educational leaders in the country have made a greater contribution to the literature of any special field.\textsuperscript{30}

The conference celebrated its twenty-fifth anniversary in 1934 and to honor this occasion nine of the organization's leading

\textsuperscript{29}Bawden, "Review of Industrial Education for the Biennium, 1934-1935," p. 84.

\textsuperscript{30}Ibid.
members, Charles Bennett, William Bawden, John Friese, Arthur Mays, George Myers, Robert Selvidge, Albert Siepert, and William Stone, collaborated on the report entitled *Industrial Arts in Modern Education*. This publication admittedly represented the views of all conference members regarding the existing "philosophy, objectives, methods, trends, and administrative problems of the industrial arts in education."\(^{31}\)

Selvidge, discussing the objectives of industrial arts, stressed much of what was proposed earlier in the decade by the AVA Committee on Standards. He indicated that objectives should not be thought of as vague and remote educational ideals but as a list of specific changes which teachers should endeavor to make in the lives of students. They are the teacher's program, and he should feel under obligation to provide experiences which will make a reasonable contribution to the ends sought.\(^{32}\)

He emphasized, as had the Committee on Standards, that objectives should be considered teacher's objectives and not the objectives of industrial arts or of general education. Developing this approach Selvidge repropose[d] the twelve objectives of the industrial arts teacher which appeared in the final report of the Committee of


\(^{32}\)Ibid., p. 31.
Standards. Selvidge pointed out that only two of the twelve objectives were primarily concerned with skill, quite contrary to the existing emphasis on that aspect of industrial arts.

Three basic methods of instruction were discussed in Industrial Arts in Modern Education by Albert Siepert: the demonstration method based on the theory of imitation, the project method centered around the construction of pre-determined models such as those associated with the sloyd system, and the problem-solving method which utilized the analytical process to promote learning. In addition more recent organizational innovations were cited; the most promising may have been the Laboratory of Industries organization implemented at the University High School of The Ohio State University under the leadership of William E. Warner.

The Laboratory of Industry organization was based on Bonser's comprehensive idea of industrial arts and revolved around a classroom laboratory designed to represent modern industry. Siepert described the program as inclusive of a "wide diversity of industries in its purview" including automotive, ceramics, metal, printing, woodwork, and others. 33

33Ibid., p. 96.
A Governmental Interpretation. Regardless of the efforts of industrial arts leaders to clarify industrial arts during the first half of the 1930's, by 1935 there appeared as yet no one unifying force behind which educators and administrators concerned with industrial arts in the public schools could combine their energies. In an answer to the persistent demand for a statement of position and interpretation of industrial arts in the public schools, the federal Office of Education appointed a Committee on Industrial Arts consisting of "outstanding persons in this [industrial arts] phase of education." It was hoped that the statements of the committee members regarding industrial arts "would command the respect of leaders in the fields of school administration and educational philosophy."\(^{34}\)

The committee was comprised of many of the leading figures in industrial arts education of the 1930's. Among those working on the final report were Maris M. Proffitt, chairman of the committee and Educational Consultant and Specialist in Guidance and Industrial Education, Office of Education; Charles F. Bauder, Director, Division of Industrial Arts in the Philadelphia public schools; Earl Bedell, Assistant Director of Vocational Education in the public

schools of Detroit; Elmer W. Christy, Director of Industrial Arts in the Cincinnati public schools; Roy G. Fales, Supervisor of Industrial Arts in the State of New York; Louis C. Mossman, Associate Professor of Education, Teachers College; A. Adele Rudolph, Special Assistant for Elementary Industrial Arts in the Philadelphia public school system; Homer J. Smith, Professor of Industrial Education, University of Minnesota; H. A. Sotzin, Director, Division of Industrial Arts Education, San Jose Teachers College; William E. Warner, Professor of Industrial Arts Education, The Ohio State University; and Leon Winslow, Director of Art Education in the Baltimore public schools.

The committee first met in November of 1934; in 1936, after almost two years of work, they offered their final report which was published by the Office of Education under the title of Industrial Arts: Its Interpretation in American Schools. The committee defined industrial arts in a broad sense, specifying that it was a curriculum area and not merely a subject or course. Specifically, industrial arts was defined as "a phase of general education that concerns itself with the materials, processes, and products of manufacture, and with the contribution of those engaged in industry." The knowledge gained in this curriculum area was to result from "the pupil's
experiences with tools and materials and through his study of resultant conditions of life."

Four general values of industrial arts were stated as common to all levels of education. First, through a program of industrial arts the pupil acquired knowledge of the changes made in the industrial society including changes relating to materials, tools, processes and personnel. Second, each pupil was to increase his appreciation for the role industry and its encompassing activities played in society as well as to gain "a background for a wise choice of a career." Third, industrial arts was to increase the student's "ability to plan constructive projects, to select and use sources of industrial and related information," to express himself with tools and materials, to acquire avocational interests and to work as a member of a group. Finally, industrial arts was to develop an attitude "of concern for safety practices, of consideration for workers in all fields, of regard for cooperation among the members of a group and of respect for property."  

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36 Ibid.
A Mundane View

While the major studies and reports published in the thirties principally affected curricula changes and teaching methods, there were other variations in the school program which seemed to occur as a result of the fluctuating nature of society. Three of the more important changes revolved around the increased number of girls in the secondary schools, the advent of aviation, and the exhibitions and contests centering on the shop project.

Girls and Industrial Arts. During the twenties and thirties the compulsory education laws affected not only the male school enrollment but also greatly increased the number of girls who attended school for an extended period of time. This change, coupled with the growing emphasis on industrial arts as an area of general education and hence a program designed for all pupils regardless of sex, caused a rapid increase in the number of girls enrolled in industrial arts subjects.

The inclusion of girls in industrial arts programs was not completely new to the fourth decade, for girls had always studied the subjects in the elementary school grades. Bonser and his disciples quite clearly emphasized that the elementary school industrial arts
studies were not meant for the boys alone, and they stressed the importance of an educated female population regarding industrial advances.

The industrial arts programs for girls were comprised of formal and informal offerings. One illustrative example of an informal program for girls was described by I. M. Fenn, an industrial arts instructor at VonSteuben Junior High School in Chicago. Basically a home mechanics course, this program was organized on a club basis as were many of the informal programs of the time; the included activities were similar to those of a general shop program. They ranged from the preparation and use of glue and the proper use of finishing and cleaning materials to the sharpening of knives and scissors and basic electrical, wood, and metal work.

In 1932 the results of an investigation entitled "Is There a Place for Girls in Industrial Arts" were revealed; included were three conclusions:

1. There exists a very definite demand on the part of high-school girls for instruction in tools, materials, and processes.
2. Shop teachers agree that, with very little change in the existing set-up of shop conditions, suitable courses in several lines of shopwork and drafting could be made available to girls.
3. Consumer appreciation should be emphasized.
Probably the outstanding problem regarding girls in industrial arts programs was "the determination of the content of such courses."  

**Aviation Attracts Attention.** In the 1930's a subject of growing importance was the study of aviation. Spurred by the historic flight of Charles Lindbergh and the subsequent increased interest in commercial aviation, schools were more than willing to offer the study of aviation and its related subjects a place in the curriculum. Robert W. Hambrook, Senior Specialist in Trade and Industrial Education, U.S. Office of Education, described the growth of aviation in the schools during the thirties as "first in club programs and then in various industrial arts hobby courses, in guidance courses, and in regular industrial education programs."  

By the late thirties the need for trained men to comprise aircraft groundcrews was nearing an acute level. A Department of Commerce figure indicated that there were "more than 100 men employed 'on the ground' for every pilot that flies."  

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37 "Industrial Arts Instruction for Girls," *Industrial Education Magazine*, XXXVI, No. 4 (September, 1934), 223.


With numerous facts and figures to support the positive public opinion, advocates of the air age found little opposition to the inclusion of aviation and aeronautics in the school curriculum. As a study of the application of scientific principles, the subject soon found its way into the industrial arts curriculum and was manifested in a number of ways. J. W. Giachino, a high school instructor of aeronautics in Hamtramck, Michigan, described a number of industrial education courses in aviation indicating that some of the basic content could be offered in industrial arts courses.\textsuperscript{40}

Although the study of aviation was heralded by industrial arts educators as a general education subject, there often appeared to be little difference between industrial arts and vocational offerings. But despite this similarity, the study of flight and the repair of aircraft flourished during the decade in all areas of industrial education.

\textbf{Exhibits and Contests.} The popularity of industrial arts exhibits and contests increased greatly in the 1930's. Spurred by the opportunity to exhibit student work and consequently promote the study of industrial arts both locally and nationally, teachers were more than willing to participate in exhibiting activities.

\textsuperscript{40}J. W. Giachino, "Aviation in the High School," \textit{Industrial Arts and Vocational Education}, XXV, No. 8 (August, 1936), 236-38.
But there also appeared during the 1930's some concern, however minute, over the misrepresentation of industrial arts through the traditional exhibits. John Metz, then editor of Industrial Arts and Vocational Education, noted certain deficiencies in the project exhibit indicating that the finished product and a name-tag had little relationship to the general education objectives of industrial arts. Metz challenged the absence of the indication of student growth in the project display and the unfair advantage that inherent mechanical ability played. He suggested another approach to displays which would be more in keeping with what industrial arts educators professed the subject to be. Four specifics were included in his plan; these concerned the age of the student, his level of education, his previous work with specific materials and tools, and a statement of specific objectives relating to the project. 41

C. A. Kunou, Supervisor of Manual Education in Los Angeles, also stressed that school exhibits include more than completed projects. He delineated the various parts of a total exhibit which he defined as "a display of educational materials, methods of presentation, activities, and children's products." He tentatively called a display of children's projects a "museum display" while a

"display of children's products and the processes involved, and methods of teaching" were called a moving display. Kunou stressed the advantages of the latter over the former.42

Not all exhibitors were concerned merely with the display of finished products. A master's thesis written by Wikoff at The Ohio State University in 1930 revealed a more advanced approach to such activities. A summary of this study suggested that exhibits include an "examination of available literature, and a review of reports of museums and expositions; analysis of examples of commercial practice in exhibits and display advertising."43

One variation of the industrial arts exhibit and contest was undertaken in 1934 by the Tulsa Cosmopolitan Club. Concerned about the opportunity for teacher participation in the preparation of student projects for exhibit, a method of competition was sought to prevent any unfair practice from influencing final awards.

A plan was designed to overcome this weakness. Under its operation a number of local or school contests were held in which the finished projects of students from each school were judged. The


43 "Potential Values of the School-Shop Exhibits," Industrial Education Magazine, XXXVIII, No. 4 (September, 1936), 221.
winners of these local contests were then allowed to compete for the final award on a city-wide basis. However, instead of the final contest consisting of the usual project displays, the final phase of the competition consisted of gathering all preliminary winners into one shop where they each made a standard project in competition with each other. The boys

in sheet-metalwork made a cookie-cutter; the boys in woodwork made a small box; in ornamental ironwork, a tie-rack; in bench metalwork, a hoe; in mechanical drawing, the pupil was given a drawing and required to supply the dimensions and dimension-lines.  

Teacher Education

The nature and extent of the higher education institutions preparing industrial arts teachers in the thirties varied greatly. A study by Paul T. McHenry of the State Teachers College at Conway, Arkansas, concerning a representative sample of undergraduate schools offering an industrial arts major provides a descriptive picture of existing programs. Forty-two schools representing twenty-two states were included in the final phase of the survey. The population of the schools included from 16 to 225 students and from 1 to 16

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44O. B. Badger, "Details of the Manual-Arts Contests," Industrial Education Magazine, XXXVI, No. 5 (November, 1934), 244.
faculty members. The most common offerings were in woodwork and
drawing, but it was revealed that many schools stressed the concept
of breadth rather than depth in preparing teachers. Fifteen of the
surveyed schools indicated that no college credit was given for trade-
school work. Conversely, a "few" schools did require trade experience
as a requirement for a degree. The total number of technical require-
ments needed for degree credit ranged from 36 to 95 "term hours"
with a mean of 51.45

A controversial problem in the 1930's revolved around the
undergraduate preparation of the industrial arts teacher. It was felt
by many industrial arts educators and administrators that new teachers
entering the field of industrial arts lacked sufficient technical skill to
present anything but a superficial industrial arts program. These
individuals strongly felt that it was the responsibility of the teachers'
college to give each teacher a deeper background concerning the
technical areas of industrial arts.

In 1936 a 25-hour major was representative of undergraduate
work in industrial arts. Benjamin W. Leib, Professor of Industrial
Arts, State Teachers College, Kirksville, Missouri, expressed the

45 Paul T. McHenry, "Industrial Arts in Teacher Colleges," Industrial Arts and Vocational Education, XXV, No. 6 (June, 1936), 176-78.
need to increase the time allotted for specialized undergraduate industrial arts work for the following reasons:

1. Beginning teachers of industrial arts generally are not sufficiently well-prepared to meet the challenge of the modern industrial arts department in a good high school.
2. Manipulative skills ordinarily cannot be learned with the same relative rapidity as ideational subject matter.
3. The beginning industrial-arts teacher cannot expect to acquire the necessary manipulative skills and technical information while he is on the teaching job.
4. Graduate schools generally do not recognize manipulative work as of graduate level. This applies to the field of industrial arts. 46

The 1930's saw a marked rise in teacher education on the post-baccalaureate level. While in the 1920's it was not uncommon to find industrial arts teachers who lacked the baccalaureate degree, the 1930's evidenced a trend which was to not only greatly increase the number of teachers in the field with the baccalaureate degree but also the number of teachers with the master's and the doctoral degree as well. By the middle of the decade, the master's degree and the doctoral degree were offered in 142 colleges and universities, and in approximately twenty-five of those institutions a major in industrial education was offered. 47


During 1934 and 1935 a study to "present and interpret" some findings regarding graduate work in industrial education was undertaken. The study included all American higher education institutions which had "granted two or more undergraduate degrees to candidates having at least 'thesis credit' in industrial education." This totaled forty-one institutions in twenty states. As might be expected the results of the study found an inconsistency among the schools regarding such things as course offerings, requirements, fees and facilities. ④⁸

The trend toward the acquisition of higher degrees was not looked upon by all educators in a favorable way. Some saw in this trend a move toward popular recognition and status and saw no care for the preparation of better teachers. Of particular concern was the research requirement connected with master's work. Verne C. Fryklund, of the University of Minnesota, in an address before the twenty-fifth anniversary meeting of the Manual Arts Conference stated:

The Master's degree will soon be a requirement for industrial arts teaching. The charm of the term research in connection with securing the Master's degree will have less important meanings to most of us in the future than it has had in the past . . . . We will sooner or later

learn that there are not many of us who know much about real research. We are attaching the magic term to graduate programs as a seeming inducement to recognition of superiority of one department or one school over another. 49

Fryklund warned that if the value of the master's degree was to be preserved, more attention would necessarily have to be given to the development of master teaching skills and technical skills.

**Industrial Arts and Progressive Education**

By the conclusion of the fourth decade of the twentieth century, a movement known as progressive education had gained partial recognition from educators and school administrators resulting in a re-evaluation of school curriculums and the implementation of subsequent experimental programs in the secondary schools across the nation. William G. Wilson from Chicago Teachers College stated the underlying assumptions of the progressive education movement as

1. Full opportunity for initiative, self-expression, and self-development of the pupil under guidance.
2. Interest, the motive of all work.
3. The teacher a guide, not a taskmaster.
4. Scientific study of pupil progress and development.
5. Increased attention to everything that affects the child's physical development.

6. Increased co-operation between school and home to meet the needs of child life.
7. The Progressive School should be a leader in educational movements, a place in which tradition alone does not rule, but the best of the past is leavened with the discoveries of today, and the result is freely added to the sum of educational knowledge. 50

The progressive education movement was regarded by many industrial educators of the period as the time of long-sought recognition of industrial arts. It was indicated that the objectives and aims of the progressive education movement were very similar to those attributed to industrial arts for many years. Reactions from industrial arts educators indicated a general welcoming of the movement although there remained skeptics in the field.

Although progressive education had been a leading topic of experimentation, discussion and controversy for some time, it was still a movement not yet crystallized by the end of the thirties.

Emanuel E. Ericson of the Santa Barbara College, University of California, wrote of the abounding confusion stating:

If I could give a clear and acceptable definition, in regard to progressive education, I would surpass the leaders of the movement, for considerable search of the literature available has failed to reveal any standardized creed.\footnote{Emanuel E. Ericson, "Implications of Progressive Education for the Industrial Arts," \textit{Industrial Education Magazine}, XLI, No. 1 (January, 1939), 7-11.}

Closely associated with the progressive education movement was the integration movement of the thirties, a philosophy which attempted to eliminate the divisional approach to secondary school learning by the substitution of an integrated or core program. 

Industrial arts was a basic part of this program and consequently many industrial arts educators favorably viewed the movement. But there were also many who denounced the program. Homer J. Smith described the movement:

\begin{quote}
At its best . . . a condition or plan to be consummated, integration means the tearing out of partitions or the erasing of dividing lines between subjects or areas of instruction.\footnote{Homer J. Smith, "Correlation or Integration, Which?," \textit{Industrial Education Magazine}, XL, No. 4 (September, 1938), 171.}
\end{quote}

Smith wrote of the probable deterioration of the shop:

\begin{quote}
It would seem regrettable if shops well equipped were to be used little in the way that we have intended; if the processes to be learned, the projects to be constructed, and the jobs to be performed were to be only those of irregular kind and of incidental use in the general units
\end{quote}
of a master program; if work places were to be idle sometimes, made exhibit spots at others, or used for the hasty throwing together of course paraphernalia at still others. 53

C. H. Christopherson listed eight significant changes in industrial arts resulting from the progressive education movement. These may be summarized as (1) an increased emphasis on "pupil development" as opposed to prior emphasis on manual skills; (2) the emergence of general education as the principal "aim" of industrial arts, with the accompanying reduction in emphasis on vocational and pre-vocational values; (3) the replacement, by and large, of "abstract exercises and formal models" with "practical projects"; (4) a greater "flexibility, variety, and enrichment" of industrial arts course content; (5) a reduction in teacher-directed activity accompanied by an increase in pupil-directed activity; (6) an increase in "excursions, movies, instruction sheets, shop manuals, and shop reference books" to provide for individual differences among students; (7) an increased integration of industrial arts with other subjects; (8) the "use of improved test and scales for diagnosing, guiding, and evaluating in the learning process." 54

53 Ibid., p. 172.
54 Christopherson, p. 109.
A National Organization Emerges

Toward the end of the fourth decade, there appeared among the ranks of industrial arts educators and administrators a nucleus of men who felt that the profession needed a national body which would independently further the cause of industrial arts on all levels of education. At that time the leading national group representing industrial arts teachers and administrators was the Industrial Arts Section of the American Vocational Association although industrial arts programs were organized and presented at the annual convention of the National Education Association and the American Association of School Administrators.

William E. Warner, a professor at The Ohio State University, discussed the multilateral industrial arts programs existing during the decade in an "Invitation to a National Conference" on industrial arts education which was to be held during the 1939 convention of the American Association of School Administrators. In his statement Warner stressed the apparent "need for a national conference to identify the problems and formulate a program" for industrial arts.55

At the annual convention of the American Association of School Administrators held in Cleveland on February 27 and 28, 1939, a conference to develop plans for the creation of a national organization devoted to the promotion of industrial arts was held. On the second day of the conference, its members formed a constitutional convention and formed the skeleton of a constitution for a new organization, the American Industrial Arts Association. Warner was the elected president of the new body; Herber A. Sotzin, State Teachers College, San Jose, California, was the first vice-president.

The purposes and form which the new organization was to have were decided after lengthy discussion and debate. Dr. DeWitt Hunt in a history of the American Industrial Arts Association wrote:

The form which the national association has taken was wrought through long and arduous debates among the early officers and leaders of the movement. Some believed that the basic aim for the AIAA should be to develop a closer unity and a stronger professional spirit among teachers and leaders in the field of industrial arts instruction in the United States. Some protagonists of the Association may have wished to secure the acceptance of a rigid belief in a specific philosophy for industrial arts education. Many believed that the Association should serve to stimulate new educational thinking for teachers engaged in industrial arts instruction."

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From this discussion emerged one prominent purpose for the association, specifically that "of improving industrial arts instruction."  

During the remainder of the decade, the meetings of the association were held concurrently with the national meetings of the National Education Association and the American Association of School Administrators. But the organization born in 1939 was to have an increasingly influential role in industrial arts education in the ensuing years.

The End of an Era

Although the fourth decade of the twentieth century witnessed much growth and prosperity in the field of industrial arts, the profession also experienced one of its greatest losses during this period. In the summer of 1938, Charles Alpheus Bennett, perhaps the most prolific and influential leader the profession of industrial education has ever had, suffered an illness which subsequently demanded the curtailment of his time and energy to professional activities which he had so generously offered for more than fifty years.

\textsuperscript{57} Ibid., p. 3.
Charles A. Bennett was born in Massachusetts in 1864. Twenty-two years later, in 1886, he was graduated from Worcester Polytechnic Institute, Massachusetts. After spending the following years as a machinist at the Brown and Sharpe Manufacturing Company, as a secondary school manual training teacher in Saint Paul, Minnesota, and as principal of the new Saint Paul Manual Training School, Bennett joined the staff of Teachers College, Columbia University, in 1891 where he taught as a professor of manual arts. In 1897 at the age of thirty-three, Bennett left Teachers College to assume the position of head of the Department of Manual Arts, Bradley Polytechnic Institute, Peoria, Illinois.

In 1899 Bennett founded what was to become the leading journal in the field of industrial education for years to come, the Manual Training Magazine. Bawden perhaps best described the origin of this professional publication when he wrote of his introduction to Dr. Bennett by William W. Murray just prior to the turn of the century.

There is a man out there in Illinois somewhere -- ... his name is Charles A. Bennett, at Bradley Polytechnic Institute, Peoria, Illinois. He wrote around to a lot of people, proposing the publication of a magazine to be devoted especially to the problems of the manual-training teacher and to the promotion of this work in the schools. He says now that the response is so encouraging that he is going ahead. He has actually started the magazine, and it is coming out as a quarterly, four times a year.
He has a fine idea, and I think everybody should get behind him and help make it go. This may develop into something very significant, and you ought to get in on it right away if you expect to get ahead.  

Bennett's life thereafter was one of continuous activity devoted to general industrial education. He wrote constantly, receiving his information from a national and international circle of friends and admirers in education and many other professions. His most renowned work is probably the two-volume publication on the history of manual and industrial education.

Along with the loss of Charles Bennett came the end for the highly respected Manual Training Magazine which had been renamed the Industrial Education Magazine in 1922. Perhaps the importance of the publication to the entire field of industrial education, and specifically to industrial arts, can best be presented by the following words from an editorial in the September, 1939, issue of Practical Education and School Crafts published in London and considered the English counterpart of Industrial Education Magazine:

For 40 years that splendid journal Industrial Education Magazine has striven worthily to advance and maintain the position of the manual arts in education, and it has done so in a manner which has secured the admiration

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and attention of readers all over the world. Its penetrating insight into the educational needs of an age such as ours made it indispensable to all who wished to appraise the advance of the industrial arts.\textsuperscript{59}

The loss of the magazine appeared to come at a time when industrial arts was achieving the greatest recognition it had ever reached; it came at a time when the industrial arts profession needed an outlet for the writings of its leaders and leaders-to-be. With the discontinuance of the \textit{Industrial Education Magazine}, there appeared a professional void in the field which has never been filled.

For those who may wonder why the publication of the magazine did not continue under the leadership of another, a statement by Homer Smith in the final issue of the \textit{Industrial Education Magazine} expressed the feelings of many:

\begin{quote}
From my point of view, I would rather the Magazine be discontinued, when you \[Bennett\] take away your hand, than that any other disposition be made of it. Let it go, and let it stand as your project and half of your life -- an extensive and important formal contribution -- a sizeable, well ordered block of the best literature that we have had -- an authentic and respected record, always to be prized.\textsuperscript{60}
\end{quote}

\textsuperscript{59}"Expressions and Sentiments on the Discontinuance of Industrial Education Magazine," \textit{Industrial Education Magazine}, XLI, No. 5 (November, 1939), 259.

\textsuperscript{60}\textit{Ibid.}, p. 260.
Summary

The start of the 1930's found industrial arts education in a state of expansion. Spurred by the increased acceptance of the subject during the third decade, leaders in the profession promoted numerous attempts to bring some clarification to the discipline. The early years of the 1930's found industrial arts undergoing severe scrutiny in many areas due to economizing measures necessitated by the depression. But despite pessimistic concerns by some educators in the field, industrial arts emerged from the depression as an established curriculum area in the majority of school systems.

One major attempt at clarification was the continued work of the American Vocational Association's Committee on Standards of Attainment in Industrial Arts Teaching. Founded in 1928 this committee, comprised of many influential men in the industrial arts profession, submitted a report in 1934 entitled Standards of Attainment in Industrial Arts Teaching which was to become one of the leading guides to industrial arts teaching of the decade. An outstanding influence on the final report of the committee was the Selvidge Plan, an organization of the study of industrial arts through the analysis of the trades.
The Terminological Investigation was another attempt at clarification of industrial arts education. Undertaken by the Western Arts Association, the report of this group strongly reflected the Bonser philosophy so prominent in many elementary and junior high schools during the 1920's. One year after the publication of The Terminological Investigation, the Ohio Education Association and the Ohio State Department of Education sponsored a report entitled The Ohio Prospectus. This study interpreted industrial arts as a "study of the industries for educational and social ends."

Perhaps the organization comprised of the largest number of industrial arts authors and leaders during the 1920's and 1930's was the Manual Arts Conference of the Mississippi Valley. By the time of this organization's twenty-fifth anniversary, its present and former members, totaling seventy-two in number, contributed to almost 300 titles, excluding magazine articles, devoted to educational topics.

Despite the many investigations and reports determined to clarify the confusion related to industrial arts, there seemed to be no acceptable consensus presented by the middle of the decade. In another attempt to bring unity to the profession, the United States Office of Education appointed a Committee on Industrial Arts. The report of this committee was published in 1936 under
the title of Industrial Arts: Its Interpretation in American Schools.

The 1930's witnessed an increase in the enrollment of girls in industrial arts programs. Although not all programs were of a formal nature, rising numbers of girls received opportunities to use tools, materials, and equipment heretofore largely limited to school boys. The advent of the air age also had its influence on industrial arts. Promoted by recent aviation successes and predictions of the future importance of aircraft, industrial arts educators and administrators attempted the study of aviation and aircraft in increasing numbers.

Of questionable influence on school programs of the fourth decade was the progressive education movement. Closely related to this movement was the core program of which industrial arts was a basic part. Many industrial arts educators hailed the progressive education movement as the complete recognition of industrial arts. However, by the end of the decade, progressive education programs were generally still in the experimental stage.

Toward the end of the decade there existed an increasing popularity for a move which would establish one national organization for the promotion and development of the industrial arts profession. The climax of this feeling was manifested in the formation of the American Industrial Arts Association in 1939. This
organization was to become one of the most influential groups devoted to the interests of industrial arts teachers and administrators.

By the end of the decade two specific views regarding industrial arts education were apparent. The first view identified itself with the standards movement and rallied behind the findings and interpretations of the American Vocational Association’s Committee on Standards and the twenty-fifth anniversary publication of the Manual Arts Conference. Leaders of this group were Robert Selvidge, Verne Fryklund, William Bawden, Emanuel Ericson, and others.

The second interpretation championed the liberal view of the curriculum area, stressing the study of industrial arts through the analysis of industry as opposed to the analysis of the trades. Expressing their views basically through The Terminological Investigation and The Ohio Prospectus, and partially through the Office of Education Interpretation, supporters often referred to the basic thinking of Frederick Bonser. The prominent leader of this group appeared to be William Warner.
CHAPTER V

INDUSTRIAL ARTS IN THE 1940's

Period of War

The 1940's found the United States in a tense international situation. With many nations already engaged in combat or severely threatened by hostile neighbors, national attention was diverted from domestic educational problems and focused upon the more immediate problems of national defense and offense.

World War II had its effect on industrial arts education as well as on virtually every aspect of American life. With the war effort consuming most of the raw materials and finished products, little remained in the way of supplies, materials and equipment for activities other than those vital to the national defense. Industrial arts as a laboratory course relying heavily on the availability of the very products which were so important to the nation was especially handicapped.

The Profession Makes Its Contribution. During the first half of the fifth decade there was very little in the field of industrial arts which could be classified as new or trend-setting. With the war
effort demanding uncompromising attention and virtually all materials, the biggest headlines in the field were related to the war effort. The periodicals of the time were dominated by news pertaining to the war; suggestions as to possible sources of materials for the shops were very popular with the industrial arts educators working on the home front. Representative of such material was an editorial by John Metz which emphasized that in

...almost every home there are old pieces of furniture no longer in use. These may furnish materials for projects of many kinds. There are still wood packing boxes to be had, although they are rapidly giving way to paper cartons. The wood salvaged from the packing boxes lends itself to many uses.¹

Since most of the material used in the industrial arts laboratory during the first half of the 1940's was from second-hand sources, the content of industrial arts courses was definitely changed. Because wood and sheet metal were perhaps the most readily available materials, the scholastic concentration was definitely on the wood and sheet metal areas. Repair operations were also stressed basically for two reasons. First, repair operations generally utilized comparatively less material than the fabrication of new products and, second, such operations could be used to revitalize equipment and

¹John J. Metz, "Industrial Arts and War-Time Service," Industrial Arts and Vocational Education, XXXI, No. 2 (February, 1942), 55.
products which would otherwise be rendered useless. Quite popular in the industrial arts courses were operations previously attributed chiefly to the home mechanics programs of the twenties and thirties.

Perhaps the biggest effect on the industrial arts program in the early forties resulted from the shortages of teachers in the field. Because of the technical knowledge and ability possessed by the industrial arts teacher, he was in great demand to fill defense positions. W. C. Giese, Superintendent of Public Schools in Racine, Wisconsin, underscored the situation in many communities when he described the situation in his own region. He indicated that "many teachers of industrial arts in our state have enlisted, or have been taken by the draft, or have given up teaching to take jobs in industry."² Giese stressed that it was almost impossible to obtain replacements for these teachers because

²W. C. Giese, "Responsibility of Industrial Arts in the Present Crisis," Industrial Arts and Vocational Education, XXXII, No. 3(March, 1943), 104.
occupation in the war effort. Enlistments and the refusal of some teachers to accept deferment has increased the severity of the shortage.  

The Prevocational Stress. The industrial arts purpose most widely stressed during these war years was, understandably, the prevocational purpose. Working closely with vocational education, itself geared to meet the demands of preparing skilled workers for the defense industries, industrial arts programs often themselves took on a vocational appearance. Since the industrial arts shops were already equipped for the most part with machines and tools capable of being utilized for vocational purposes and since the industrial arts instructors were capable of teaching intensive prevocational courses, by virtue either of their industrial experience or teaching background, there was actually little that was physically new to the war program. It basically required a shift in emphasis on objectives.

But there were specific effects of the war effort on industrial arts programs, some of which were to remain permanently after the end of the war. One of the most prominent of these was the increase in the number of girls enrolled in the industrial arts courses. While the enrollment of girls expanded in the thirties, the increase in enrollment in the early forties was very noticeable. R. H. Roberts,

\[3\text{Ibid.}\]
Area Training Supervisor, War Manpower Commission in Tulsa, Oklahoma, cited that in "the Chicago schools alone the number of girls enrolled increased from 15 in 1939 to 25,000 in 1943." While perhaps this increase is not representative of occurrences throughout the country, principally due to the fact that the Chicago schools did not have a prominent enrollment of girls in the industrial arts programs before the war, it does underscore the importance of girls in the industrial arts programs of the early forties. One of the basic reasons for this sudden increase was again due to the prevocational nature of the war-time industrial arts program. Since many of the high school graduates and drop-outs would enter defense occupations, it was extremely necessary to prepare for such work while still in school.

Aviation in the Laboratory. Another immediate effect of the war on the industrial arts programs was the addition of new courses to the curriculum. Perhaps the most evident of the new work was in relation to the aviation industry. Roberts indicated that the aircraft industry with its new production problems has probably had more influence on... [Industrial arts] than any other single industry. The tremendous demand

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in this industry for the fabrication of light metals has had a decided influence on the metalwork and the woodworking fields especially. 5

With the almost total emphasis on the war effort, the study of aviation in industrial arts included a number of special projects. Perhaps the most widely publicized of these was the Model Aircraft Project, sponsored by the United States Office of Education. The project, covering almost a two-year period, produced almost one million model aircraft for military training schools.

The Model Airplane Project originated as a result of the need for model aircraft for training purposes by the armed forces. Hampered by the lack of metal and rubber materials, commercial organizations produced very few of the model aircraft necessary for training programs. In the beginning of 1942 the Navy Bureau of Aeronautics with the United States Office of Education launched the plan which was to involve "800,000 youths in 6,000 schools under the supervision of 6,000 teachers."6

The start of the project centered around the making of one plane by one boy. With the specifications and plans provided by the Navy Bureau of Aeronautics, it was the industrial arts teacher's

\[5\text{Ibid.}\]

position to provide the educational principles necessary for the undertaking to be a true learning situation and not merely a form of war production work. As the program progressed, the individual construction approach was abandoned and the mass production technique was substituted. Following the war the Office of Education gave eighty models, representing every state and territory, to the Smithsonian Institute to "serve as a record of progress in aviation and of the contribution of the nation's schools to aviation in World War II."^7

The War Leaves its Impression. Although most of the features of the wartime industrial arts programs were considered to be temporary, a few were to have a serious negative influence on the discipline in the post-war years. Since the pre-vocational objectives of industrial arts were particularly stressed during the time of crises, many accompanying educational methods were readily accepted.

Early in the forties the War Manpower Commission and the Selective Service System introduced the Manning Table Plan, a system designed to determine precisely how many workers were needed to operate an industrial establishment. The Manning Table Plan

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^7"Model Planes Placed in the Smithsonian," AVA Journal and News Bulletin, XXI, No. 7 (September, 1946), 44.
consisting of among other things "a complete man-power inventory of the industrial plant" listed

all of the jobs in the plant, the number of persons presently employed in these jobs, the time required to train inexperienced people, the number of physically handicapped workers employed, jobs which women could do, jobs where handicapped workers can be used and several other pertinent items. 8

Used closely with the Manning Table Plan was the Dictionary of Occupational Titles, an index of job descriptions helpful in aiding employers to prepare the table.

The preparation of a Manning Table was accomplished through the use of the analytical process. Consequently, it was necessary to have job descriptions for each payroll position. After each job was defined, usually with the use of the Dictionary of Occupational Titles, the jobs were grouped into "families." The family grouping of jobs was based on three characteristics: similarity in the type of work executed, skills and personality characteristics needed, and equipment and aids involved.

Since the Manning Table Plan and the Dictionary of Occupational Titles prompted employers and subsequently educators into thinking in terms of specific jobs and operations, it was inevitable that such reasoning would soon be reflected in courses of study.

8Roberts, p. 141.
Hence, industrial arts work in many cases became a system of job preparatory steps, a system which was not readily abandoned after the war because it made teaching a very systematic, methodical, and comparatively facile operation.

Post-War Position

Industrial arts education following the war was a discipline dominated greatly by the wartime need to prepare vocationally proficient workers. Retaining many of the efficient methods used to prepare individuals for specific operations, post-war industrial arts was soon the topic of discussion in many educational circles.

Perhaps the most widely accepted statement of industrial arts aims was that prepared in the early thirties by the American Vocational Association's Committee on Standards of Attainment in Industrial Arts Teaching. However, the number of aims and objectives of industrial arts education listed by the Committee on Standards appeared to be too large for many educators. In an effort to consolidate the aims of the committee into a manageable and obtainable number, many subsequent statements of aims and objectives were made.

A. F. Dodge, Associate Professor of Industrial Education, University of Illinois, analyzed the American Vocational Association's
objectives and divided them into two main groups. The first group related to attitudes and consisted of seven in number; the second group related to knowledge and skills. Dodge felt that only those objectives in the latter group indicated subject matter, stressing that the others indicated methods "which should be used in the knowledge and skills."\(^9\)

**Post-War Studies.** An extremely revealing study on the post-war status and position of industrial arts on the national scale was reported by William R. Anderson of the St. Paul, Minnesota, Roosevelt Junior High School in 1947. In his study, Anderson reviewed all the existing state syllabuses for industrial arts in an attempt to objectively determine the availability, currentness, and nature of such material.

Anderson found that in the post-war period "about one half of the states" had some form of state syllabus, the oldest having been printed in 1930 while the most recent was printed during the war in 1944. During this fourteen-year period only two states reported a

\(^9\)A. F. Dodge, "Objectives of Industrial Education," Industrial Arts and Vocational Education, XXXI, No. 1(February, 1942), 5.
revision in their syllabuses. The number of pages devoted to industrial arts in these publications also varied greatly among states from a minimum of 1-1/2 pages in the New Mexico publication to 897 pages in the New York publication.

The number of objectives listed varied from state to state with four of the states failing to list any general objectives while one state included fifteen objectives of a general nature. The total number of considerably different objectives from all the states was twenty-five with the average number of objectives per state being seven. Only seven of these twenty-five objectives were listed by eleven or more states:

To develop elementary skills in the use of the common tools and machines.
To provide a means of vocational guidance.
To develop the ability to select wisely, care for, and use properly the things one buys.
To develop an appreciation of good workmanship and good design.
To develop the habit of an orderly method of procedure in doing anything.
To develop the habit of careful and thoughtful work.
To develop an attitude of readiness to assist others.\textsuperscript{10}

Anderson found a total of thirty-seven different subjects taught in the reporting states. The following ten were most

\textsuperscript{10}William R. Anderson, "State Syllabi in Industrial Arts," Industrial Arts and Vocational Education, XXXVI, No. 7 (September, 1947), 286.
frequently mentioned; the accompanying numeral indicates the number of states listing the activity:

<table>
<thead>
<tr>
<th>Activity</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bench woodworking</td>
<td>19</td>
</tr>
<tr>
<td>Electricity</td>
<td>17</td>
</tr>
<tr>
<td>Mechanical drawing</td>
<td>16</td>
</tr>
<tr>
<td>Auto mechanics</td>
<td>10</td>
</tr>
<tr>
<td>Sheet metal</td>
<td>9</td>
</tr>
<tr>
<td>Home mechanics</td>
<td>8</td>
</tr>
<tr>
<td>Machine shop</td>
<td>8</td>
</tr>
<tr>
<td>Architectural drawing</td>
<td>8</td>
</tr>
<tr>
<td>General metals</td>
<td>8</td>
</tr>
<tr>
<td>Printing</td>
<td>7\textsuperscript{11}</td>
</tr>
</tbody>
</table>

One interesting note made by Anderson in his summary described the average cover of the post-war industrial arts state syllabus as "brown paper, printing suggestive of a dry, out-of-date study report."\textsuperscript{12}

In another study, Glenn D. Warrick of the Western Washington College of Education, Bellingham, Washington, attempted to determine the "postwar aims or objectives of the industrial-arts programs in the secondary schools of the North Central Association."\textsuperscript{13} Warrick's study took the form of a questionnaire sent to over seven hundred industrial arts teachers affiliated with the North Central Association.

\textsuperscript{11}Ibid., No. 8 (October, 1947), 322.

\textsuperscript{12}Ibid.

\textsuperscript{13}Glenn D. Warrick, "Industrial Arts Objectives," Industrial Arts and Vocational Education, XXXVI, No. 7 (September, 1947), 287.
Each participant in the study was asked to rank a list of industrial arts objectives, selected from the prominent sources of the period by Warrick. Fifteen objectives selected from an original list of thirty-seven were included in this final questionnaire. Below, the fifteen objectives are listed in order of rank received for being "of major importance."

1. Pride and interest in accomplishments
2. Desirable habits and attitudes
3. Planning
4. Exploratory opportunities
5. Skills and techniques
6. Appreciation (of workmanship, design, etc.)
7. Vocational guidance
8. Knowledge of industrial procedures
9. Consumer knowledge or related information
10. Self-expression and problem-solving attitudes
11. Vitalization of academic subjects
12. Leisure-time interests
13. Social-economic co-operation
14. Prevocational purposes
15. Handy-man activities

An interesting conclusion drawn by Warrick from his research was that "the industrial-arts objectives receiving the highest rating from prewar industrial-arts sources have not shifted radically in degree 'of importance.""

Shortly after the war Ivan Hostetler, Chairman, Division of Fine and Applied Arts, Georgia Teachers College, Georgia, made a

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14 Ibid., p. 288.
national survey involving nine hundred leaders in industrial education, labor, and management to determine existing opinions regarding industrial education. The consensus regarding objectives and needs specifically relating to industrial arts included:

The need for industrial education in the postwar period will exceed that of the prewar period.

Both industrial arts and vocational-industrial education are needed in the public schools. Neither the one nor the other is adequate by itself.

In the interest of national security, the public schools should provide basic industrial education (general training in the care and use of common tools, materials, and machines).

The industrial education program in the secondary and evening schools should provide opportunities in home mechanics, home maintenance, and home planning for youth and adults.

Because of its importance in industry and for consumer purposes, all students should have an opportunity to learn to read blueprints and to make simple working drawings.15

Arthur B. Mays, Professor of Industrial Education, University of Illinois, writing in 1946 stressed ten areas of industrial arts which should receive emphasis:

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15 H. H. London and Ivan Hostetler, "Industrial Education in the Years Ahead," Industrial Arts and Vocational Education, XXXV, No. 4 (April, 1946), 147.
1. There must be more emphasis upon skill, both in manual and machine processes taught....

2. More scientific and technical knowledge must be imparted in connection with the shop instruction....

3. The growing complexity of industrial processes and of economic and vocational life make urgent an increasing stress upon the development of the habit of analytical, constructive thinking....

4. More attention must be given in course offerings to new materials, new procedures, and new applications of the sciences to the daily work of the world....

5. Shop equipment, arrangement, and organization must be a more accurate representation of modern industry....

6. Industrial arts must be assigned a larger place in the time schedules of the school....

7. Industrial arts must be made available to hundreds of thousands of children and youth who are now denied the opportunity for such experiences....

8. A closer relationship between the offerings of industrial-arts courses and those of vocational-industrial education is needed....

9. Greater attention should be given to forms of industrial-arts appropriate for the elementary grades as a required feature of the elementary education of every child....

10. Finally, more outstanding boys and young men must be urged to prepare for industrial-arts teaching as a lifework....

16 Arthur B. Mays, "Needed Emphasis in Industrial Arts," Industrial Arts and Vocational Education, XXXV, No. 7 (September, 1946), 280-81.

Influential Proposals

While the 1940's did not produce the number of new industrial arts projections and programs which the 1930's produced, there were
nevertheless several proposals which gained national attention. Close inspection of this material reveals an existing influence from the two prominent industrial arts philosophies in evidence at the close of the fourth decade.

**Standards Revised.** At the start of the fifth decade, the American Vocational Association prepared plans to revise the much demanded report of the Committee on Standards of Attainment in Industrial Arts Teaching, which had been perhaps the most widely accepted source regarding industrial arts standards during the fourth decade. However, with the onset of the Second World War, the task was delayed, and it was not until June of 1946 that the revision could be completed. It was published under the title **Improving Instruction in Industrial Arts.**

The task of revision was undertaken by a number of former members of the original Committee on Standards with the assistance of several new members. Serving on this committee were Homer J. Smith, Chairman, University of Minnesota; William T. Bawden, Kansas State Teachers College, Pittsburg, Kansas; Clyde A. Bowman, The Stout Institute, Menomonie, Wisconsin; Emanuel E. Ericson, Santa Barbara College, University of California; John F. Friese, Pennsylvania State College; Verne C. Fryklund, The Stout Institute, Menomonie, Wisconsin; Arthur B. Mays, University of Illinois;
Frank C. Moore, Board of Education, Cleveland; Maris M. Proffitt, United States Office of Education; William E. Roberts, Board of Education, Cleveland (retired); Robert W. Selvidge, University of Missouri (deceased); and George F. Weber, Board of Education, South Bend, Indiana.

The revised publication of the Committee on Standards increased the number of learning units from the original eleven to eighteen and included one additional unit containing miscellaneous fields of industry which could be used as "separate subjects or as brief parts of more comprehensive programs."17 Some of the newly included units were art-metal work, bookbinding, foundry work, pattern-making, ceramics, plastics, and leather work.

The committee, as previously, listed the objectives of industrial arts education as teacher objectives and identified nine specifically. Each objective was intended to develop in each pupil the following:

1. . . . an active interest in industrial life and in the methods and problems of production and exchange.
2. . . . the appreciation of good design and workmanship, and the ability to select, care for, and use industrial products wisely.

3. ... the habits of self-reliance, self-discipline, and resourcefulness in meeting practical situations.
4. ... a readiness to assist others and to join happily in group undertakings.
5. ... desirable attitudes and practices with respect to health and safety.
6. ... a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests.
7. ... the habit of an orderly, complete, and efficient performance of any task.
8. ... an understanding of drawings, and the ability to express ideas by means of drawing.
9. ... a measure of skill in the use of common tools and machines, and an understanding of the problems involved in common types of construction and repair.  

A Curriculum to Reflect Technology. In 1947 the American Industrial Arts Association held its first post-war national convention in Columbus, Ohio. The feature presentation at this gathering was a new curriculum proposal entitled The New Industrial Arts Curriculum, later renamed A Curriculum to Reflect Technology. Developed by William E. Warner and a group of graduate students at The Ohio State University, this program defined industrial arts functionally as a general and fundamental school subject in a free society ... concerned with providing experiences that will help persons of all ages and both sexes to profit by the technology, because all are involved as consumers, many as producers, and there are countless recreational opportunities for all.  

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18 Ibid., p. 51.
19 William E. Warner et al., A Curriculum To Reflect Technology (Columbus: The Ohio State University, Teacher Education Program, 1947), p. 5.
The program was to involve students at all levels of education. On the elementary school level the program provided "the basis or means for integrated activity programs," and on the junior high school level it provided "the orientation program concerning the technology." In the senior high school the Curriculum provided "specialized elements of the technical program and a sound basis for a possible industrial-vocational education." At the collegiate level the program provided "technological studies and activities of consumption, production, and recreation in the core program, and elements of technical training in the terminal programs" while at the "later adult" levels the program provided "recreational and consumer activities for all, along with elements of the technical as required." 20

The content of the new curriculum was derived via a socio-economic analysis of the technology and not by job or trade analysis as of old from the commoner village trades such as those of the carpenter, the blacksmith, the cabinet maker, ...

Whether or not this derivation was aimed to refute the job and trade analysis approach of the American Vocational Association's Committee on Standards cannot be surely stated; however, the inference does seem to be present.

20 Ibid.
Subject matter was classified into five groups: power, transportation, manufacturing, construction, and communication. A sixth group, personnel and management, was added later. The methods used to present this program involved "a full gamut including: research, planning, work experience as a means to an end, field study, personnel and physical organization, illustrative aids, conferences, creative expression, ...." The physical laboratory was to echo the principal elements of the technology: its development and uses of power, its transportation, its construction including housing and home furnishings, its communication even including the use of such specialized techniques as radar, and its basic types of manufacture.21

The Florida Plan. One year after the presentation of the new curriculum at the American Industrial Arts Association convention in Columbus, the Florida State Department of Education published a new syllabus entitled A Brief Guide to Teaching Industrial Arts in the Secondary Schools. Sometimes referred to as the Florida Plan, the purpose of the publication was "to present a number of the major educational needs in an age of technology, during which the science of industry has become a dominant element in our national life."22

21Ibid., p. 6.

The Florida Plan attempted to justify the structure of an industrial arts program designed according to the new curriculum. In describing the scope of industrial arts through the ages, five basic study areas were clearly identified. The struggle for expression was seen as man's first form of communication. The idea of multiplying his effort to increase his power was used when he was able to move the stone with the pole. His crude efforts in building the cart were probably man's first attempt in the realm of manufacture and construction. The use of the cart offered the first idea of transportation. Hence, in this broad interpretation, the varied industrial arts are the bases of all education throughout all time.²³

The Florida guide identified industrial arts activities on eight different educational levels. Starting in the nursery and kindergarten levels,

industrial arts makes its first contribution to the development of the child.... Here the child plays with models and replicas of objects such as telephones, trains, boats, dolls, and houses, which in later life will have a very basic meaning in all experiences.²⁴

Under the Florida Plan industrial arts in the lower elementary grades satisfied the child's "desire to create something with his own hands" and, in addition, afforded him "the opportunity to learn how to work with others in group participation, to learn about the

²³Ibid., p. 2.
²⁴Ibid., p. 6.
various materials at his disposal and how other people have utilized these materials." In the upper elementary school level the child was "ready to explore further those fields which his investigative mind has opened to him"; industrial arts gave him not only this opportunity but also the opportunity to "understand better something of the industrial age, the changes it has made in the modern way of life, and the contributions which have been made by industry."²⁵

In the junior high school industrial arts provided the student with a wide variety of learning experiences related to industrial living,...emphasized as orientation or exploratory experiences based on the many phases of industrial arts values which will include a study of the products of the local community.²⁶

In general, the junior high school program proposed in the Florida Plan was consistent with the idea of exploration upheld by early advocates of the junior high school. Concluding the secondary school experience, industrial arts work on the senior high school level was still "exploratory" but with an increased emphasis "placed upon the development of skills, industrial information, and the practical application of these in real life experiences."

²⁵Ibid., pp. 6-7.

²⁶Ibid., p. 7.
Regarding post-high school education, the Florida Plan distinguished between three levels of education. In the junior college industrial arts would offer general unit shops of an exploratory nature, in which students who have been denied privileges of industrial arts experiences in past educational preparation, may have a chance to find themselves and do more extensive work in selected special fields such as mechanical and architectural drawing, advanced machine shop, advanced forestry, industrial arts teacher-training. The subject field will be governed by representative industries native to the locality and also by the desire of the individual student for specialized training.27

The senior college would provide industrial arts experiences of a more specialized nature "leading to a variety of professional work such as advanced mechanical and architectural drafting, engineering, and special shop courses."

Adult education was definitely seen as another "responsibility of the state and the community"; industrial arts offerings on this level were to be determined by local demand, physical facilities, and the ability of the teacher... [and] may well include furniture and cabinet making, mechanical drawing, house design, home furnishings, home mechanics, boat building, courses in metal work, and machine shop.... The program may be recreational, vocational, or both.28

27Ibid., p. 8.

28Ibid., p. 9.
The Florida guide was pregnant with ideas and suggestions which could theoretically justify industrial arts in the public school curriculum from numerous viewpoints. Almost any activity, even those considered by many as routine school activities, was defended as being part of industrial arts education. As with the new curriculum, there seem to have been no successful major implementations of the Florida proposal, and consequently the proposal remained only that for years thereafter. Perhaps even more important was the fact that no major teacher education program was realistically developed to prepare new teachers to fulfill this promising plan.

New Texts Emerge. During the latter part of the fifth decade, a number of texts pertaining to the general teaching of industrial arts in the public schools were published. One of the more widely accepted publications was written by Gordon O. Wilber, Director, Division of Industrial Arts Teacher Education at Teachers College, Oswego. The foreword, written by William E. Warner of The Ohio State University, stated the position of industrial arts in the late forties.

Industrial Arts, as a phase of general education, has been so engrossed in minutiae that it has lost sight of its tremendous mission. Industrial Arts has been caught
between its humble origin of simple shop work and a soaring technology -- and hasn't quite made up its mind to stop playing the role of an ostrich.\textsuperscript{29}

Warner emphasized the rapid technological changes taking place in the society of the time and proposed that

\begin{quote}
Industrial Arts, therefore, has a new and profound mission of orienting everyone, especially in regard to the pertinent aspects of production, consumption, and recreation.\textsuperscript{30}
\end{quote}

Wilber discussed the role of industrial arts in general education and in the society at large. While acknowledging the definitions of the curriculum area given earlier by Bonser and Mossman and Fales, he proposed the definition which defined industrial arts as those phases of general education which deal with industry -- its organization, materials, occupations, processes, and products -- and with the problems resulting from the industrial and technological nature of society.\textsuperscript{31}

Wilber emphasized the important obligation general education had in transmitting a way of life to all students and reasoned that

\begin{quote}
If, ... an important purpose of education relates to the transmission of the social culture, then the vital place which industry holds in the American way of life should
\end{quote}

\begin{footnotes}
\footnote{Gordon O. Wilber, Industrial Arts in General Education (Scranton, Pa.: International Textbook Co., 1948), p. v.}
\footnote{Ibid.}
\footnote{Ibid., p. 2.}
\end{footnotes}
certainly call for major emphasis upon those phases of the program that deal with its exemplification in the schools.\textsuperscript{32}

From this he went on to stress the importance of industrial arts in the accomplishment of this goal.

Wilber listed nine major objectives of industrial arts:

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes and operations, products, and occupations.
2. To develop recreational and avocational activities in the area of constructive work.
3. To increase an appreciation for good craftsmanship and design, both in the products of modern industry and in artifacts from the material cultures of the past.
4. To increase consumer knowledges to a point where students can select, buy, use, and maintain the products of industry intelligently.
5. To provide information about, and -- in so far as possible -- experiences in, the basic processes of many industries, in order that students may be more competent to choose a future vocation.
6. To encourage creative expression in terms of industrial materials.
7. To develop desirable social relationships, such as cooperation, tolerance, leadership and followership, and tact.
8. To develop safe working practices.
9. To develop a certain amount of skill in a number of basic industrial processes.\textsuperscript{33}

\textsuperscript{32}Ibid., p. 21.

\textsuperscript{33}Ibid., pp. 42-43.
It was stressed that behavioral changes were the actual outcomes of all objectives, and to this end Wilber discussed the desired behavioral changes of each of his mentioned objectives.

There was one major criterion for the selection of subject matter, regardless of what particular curriculum area one spoke of. Wilber stressed that

Subject matter should be chosen or rejected exclusively on the basis of whether or not it contributes toward meeting the specific objectives which the teacher or administrator has in mind for the particular group of students. Such objectives would, of course, have in mind the needs and interests of the pupils as well as those of the community and society in general.34

More specifically,

The test for judging whether any specific item of subject matter should be included in a given course, is, therefore, to ask the question, "Does it contribute significantly toward bringing about one or more of the desired behavior changes?"35

Regarding the selection of the proper vehicle for providing the necessary experiences to achieve the desired behavior changes, Wilber listed eight criteria:

1. Is the project in keeping with the grade level and ability of the student?...
2. Does the project promote the type of behavior changes desired?...
3. Does the project have real interest for the student?...
4. Is the project well designed?...
5. Is it economical of materials?...
6. Can it be built within a reasonable length of time?...
7. Is the material selected suitable for the project?...
8. Does the project involve processes which are related to industrial methods and techniques?... 36

Another widely accepted text on the teaching of industrial arts was written by Emanuel E. Ericson, Professor of Industrial Education at the University of California and a notable figure in the field for many years. Regarding existing objectives, Ericson identified two general classifications. First there was the "concerted, broad, general acceptance of some repeated values of the industrial arts program." Second, there "was great diversity of individual thought and expression concerning emphasis and terminology used in expressing specific aims and outcomes for various courses and offerings." 37

Ericson indicated that much of the existing confusion regarding the objectives of industrial arts was the result of the misunderstanding of the curriculum area; he particularly noted existing confusion between industrial arts and vocational education. Ericson

36 Ibid., pp. 92-94.
mentioned ten "desired goals" of industrial arts, refraining from
calling them objectives but strongly indicating that they could be
easily reworded and called objectives "by anyone who prefers to use
that term and approach."

1. Self-discovery by the pupil of his own abilities and
aptitudes, leading toward maturing life interests.
2. Satisfying experience in self-expression through
creative effort leading to material accomplishments.
3. Understanding of industry and methods of production,
and of the influence of industrial products and services upon
the pattern of modern social and economic life.
4. Appreciation of good design and good workmanship
in their application to construction and to manufactured
products.
5. Judgment and resourcefulness in selection, purchase,
use, and care of industrial products and services both in
the home and in occupational life.
6. Ability to use tools and materials leading to house-
hold maintenance, leisure time pursuits, and in some
degree, to basic occupational skills.
7. Ability to read and make sketches and drawings used
for illustrative and construction purposes, including the
ability to read graphic and technical illustrations in books
and magazines.
8. Development of maturing work habits, feeling of
responsibility, and ability to plan and execute work alone
and in cooperation with others.
9. Basic experience in the use of tools, machines, and
materials of value in carrying on future educational and
professional work on scientific and technological levels.
10. Development of safety habits and fundamental safety
consciousness not only in the school but in the home and
in future occupational life. 38

38 Ibid., p. 250.
An examination of Ericson's goals and the teachers' objectives listed by the American Vocational Association's Committee on Standards shows a close relationship between the two.

Regarding the selection of subject matter, Ericson listed thirteen questions which must be considered before an initial analysis of subject matter is made:

1. Does the type of work proposed represent a broad, typical industrial activity?
2. Is it rich in educational content?
3. Does the subject lend itself to school procedure?
4. Does the subject suit the ages and maturity of the students?
5. Is the cost of installation reasonable?
6. Are materials too expensive?
7. Is there local representation of the activity?
8. Are teachers available?
9. Is there time in the schedule?
10. Are students interested?
11. Is local sentiment in favor?
12. Is the superintendent or principal enthusiastic?
13. Is it the teacher's pet scheme? 39

Ericson specified that after the initial analysis was made, specific subject matter was to be selected which would meet the specific objectives of a particular course.

39 Ibid., pp. 267-69.
Teacher Education

Immediately after the end of the war, the industrial arts profession set upon the task of preparing teachers for the many industrial arts shops which were soon to reopen or open as completely new facilities. To prepare the large number of new teachers demanded by the profession, the subsequent teacher preparation program was to be numerically the largest undertaken by higher educational institutions to date.

Undergraduate Study. After the war many suggestions regarding the improvement of teacher preparation programs were presented by teachers in the field. Some of these suggestions contained useful material; others consisted merely of words. Claude E. Nihart, Director of Vocational and Practical Arts in Los Angeles, in an article published in 1946 stressed seven major characteristics of a superior teacher preparation program. He emphasized, among other things, that the "best teaching and organization practices should be in evidence" in the higher educational institution and that more emphasis should be placed on "hand tools and machine skills." He noted the importance of current course content and instructional materials. He also felt that there should be a process of selection
implemented which would eliminate from the teacher preparation corps those who were not fitted to be teachers.\textsuperscript{40}

Frank J. Kovach, Head of Industrial Education at the State Teachers College in Duluth, Minnesota, proposed a five-year program of teacher preparation. In Kovach's program the first two years of preparation consisted of general education courses in "basic fields such as social sciences, natural science, general psychology, geography, music, art, and industrial studies."\textsuperscript{41} Education courses were introduced in the freshman year and were continued throughout the five-year period of preparation. While the first two years of each student's education would consist of a faculty-structured program, the subsequent three years would be comprised of a minimum of required subjects and a maximum of elective subjects. Many of the features proposed by Kovach are presently being discussed by the advocates of the five-year teacher education program.

\textbf{Graduate Programs}. In the final years of the fifth decade, there appeared to be much open disagreement regarding the purpose, nature, and content of graduate courses in industrial arts. Although

\textsuperscript{40} Claude E. Nihart, "Industrial-Arts Teacher Training," \textit{Industrial Arts and Vocational Education}, XXXV, No. 9 (September, 1946), 384.

\textsuperscript{41} Frank J. Kovach, "A Five-Year Curriculum in Teacher Training," \textit{Industrial Arts and Vocational Education}, XXXV, No. 9 (September, 1946), 385.
this disagreement was not new to the profession, the problem assumed new dimensions with the post-war preparation of large numbers of industrial arts teachers.

Arthur B. Mays, in a discussion of existing problems in graduate industrial education programs, cited the diverse feelings among industrial arts educators of the time regarding graduate study. He cited a "distinguished educator of international fame [who] recently remarked that graduate study is anything one studies after he is awarded a bachelor's degree" and others who "seem to think that the fifth year should merely provide the student with materials he needs in his vocation which he failed to acquire during the first four years."42

One of the controversial issues in industrial arts graduate study revolved around the place of laboratory work. Many educators felt that laboratory work should be limited to undergraduate study, leaving the graduate study for advanced research and methods work. Struck and his Committee of the National Association of Industrial Teacher Trainers found in 1941 that the consensus among professors and administrators involved with graduate work in industrial education felt that no graduate credit should be given for shop activities unless

this work was of an advanced nature. It is unfortunate that this feeling evolved into the situation which almost completely eliminated opportunities for graduate students to develop skills in one particular area, similarly to the way an engineer or doctor would pursue highly specialized study.

DeWitt Hunt, Head of the Department of Industrial Arts at Oklahoma A. & M. College, listed eight specific purposes of graduate study for industrial arts teachers. These purposes related to (1) the improvement of teaching ability; (2) the preparation of, among other things, instructional materials and reports of investigations; (3) the extension of "knowledge and ability" in specific industrial arts areas; (4) increased familiarization with professional literature; (5) further introduction of the teacher to "professional leadership in the field of industrial arts"; (6) the use of the scientific method; (7) an opportunity of keeping abreast of changing objectives and practices in general education; and (8) the review of current research findings, not only in industrial arts but in related areas of industry and education.

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Discussion regarding the post-undergraduate education of teachers was not limited to degree-granting programs. Increased mention is made in the literature of the period of the role of in-service programs to keep industrial arts teachers abreast of newly developed methods of teaching, tools, and materials. Chris H. Groneman of the Industrial Education Department, Agricultural and Mechanical College of Texas, described the existing types of in-service training programs as "city supervision; college teacher-training follow-up; national, state, and regional supervision; and self-improvement." 45

A New Organization Grows

The American Industrial Arts Association, founded just prior to the close of the fourth decade, expanded rapidly during the 1940's. Particularly responsive to the needs of the industrial arts profession during the period of post-war recuperation, the association was soon to become a leading national educational organization.

A constitution governing the activities and functions of the association was officially adopted at a meeting of industrial arts teachers and administrators in Atlantic City, on February 25, 1941.

45 Chris H. Groneman, "In-Service Development of Industrial-Arts Teachers," Industrial Arts and Vocational Education, XXXVIII, No. 5 (May, 1949), 187.
The purposes of this organization, as stated in its constitution, were:

A. To derive, define, and foster the professional ideals of industrial arts as general education in the United States and abroad.

B. To establish and maintain professional affiliation with the NATIONAL EDUCATION ASSOCIATION OF THE UNITED STATES and its Departments, and to cooperate with the various national, regional, territorial, state, district, local, and foreign education associations, and their departments or affiliates.

C. To assist in achieving the aims of education conceived of as experience through the arts and industries and related areas for everyone: (1) in the integrated activity curricula of the ELEMENTARY schools; (2) in the orientation, technical, recreational, and consumer programs of the SECONDARY schools; (3) in the social and typical SPECIAL type programs; (4) in the core, recreational, creative, technical, terminal, consumer, and other related type programs of the JUNIOR AND SENIOR COLLEGES; (5) in the professional curriculums leading to the three degrees in TEACHER EDUCATION programs; (6) in the recreational and other related ADULT type programs; (7) in the FEDERAL AND FEDERALLY subsidized and/or controlled programs involving industrial arts for peace or preparedness, which are not specifically vocational (e.g. N.Y.A., C.C.C., W.P.A., and others); and to appoint Vice-Presidents of the Association to foster the development of each of the above.

D. To create a LIAISON AND ADVISORY BOARD composed of representative leaders from education, labor, industry, business, government, and the museums who shall be invited to meet annually and counsel in the development of the policies and programs of the Association.
E. To initiate and support clubs and forums, associations and conferences, conventions and exhibits, committees and commissions, researches and publications, and field experiments and exemplary programs on behalf of industrial arts education.

F. To receive, hold, and administer funds and property; and to do any and all other professional acts in order to realize the purposes of the AMERICAN INDUSTRIAL ARTS ASSOCIATION. 46

Six kinds of memberships were sanctioned by the constitution: active, associate, sustaining, life, honorary, and student. The original constitution was to be the effectual standard until 1950 when, at the Cincinnati convention, a revision of the Constitution was made. At the 1942 annual convention of the National Education Association held in Denver, the American Industrial Arts Association was granted "Departmental" status in the NEA.

In 1941 the Industrial Arts Teacher, a periodical which became the official publication of the association, was started. The first editions of this publication, then resembling a bulletin, were generally limited to four pages and consisted mainly of information pertinent to its membership. However, like the association itself, the publication assumed increasing responsibility for the dissemination of contemporary material to industrial arts educators and soon grew in stature and pagination.

46 DeWitt Hunt, "History of the American Industrial Arts Association" (American Industrial Arts Association, 1960), pp.139-40. (Mimeographed.)
During the war years the activities of the new association were extremely limited. Besides experiencing the material restrictions so necessary in the war effort, many of the organization's leaders were serving in the armed forces. However, even through the war years, the association continued publication of its Industrial Arts Teacher.

In 1947, with the Second World War now a tragic memory, the first AIAA convention to receive "adequate national publicity" was held. The convention city was Columbus, Ohio; the theme was "New Developments in Industrial Arts Education." It was at this annual gathering that the "New Curriculum," discussed earlier in this chapter, was presented. By the end of the decade, the American Industrial Arts Association was an established organization representing and promoting the interests of industrial arts education and its devoted teachers and administrators.

One of the most important occurrences of the fifth decade for the industrial arts profession took place in 1948 when, in January, the United States Office of Education announced the appointment of John R. Ludington, a former officer of the American Industrial Arts Association, to the position of Specialist for Industrial Arts. The

\[\text{Ibid.}, \ p. \ 18.\]
establishment of such a post had long been one of the goals of the American Industrial Arts Association. In 1955, Ludington became Chief, Secondary Schools Section, United States Office of Education. His former post was temporarily filled by DeWitt Hunt of Oklahoma A. and M. College until the appointment of Marshall L. Schmitt took place in 1957.

Summary

The beginning of the 1940's found industrial arts influenced by two emergent philosophies. The first philosophy, advocated mainly by leaders of the American Vocational Association's Committee on Standards, approached the study of industrial arts via an analysis of the trades. The second philosophy, championed by many members of the original movement to form the American Industrial Arts Association, attempted to study industrial arts through a breakdown of industrial processes. Although both philosophies claimed many identical objectives, their derivation of subject matter necessitated different courses of study.

The growth of industrial arts was interrupted during the first half of the fifth decade by the Second World War. Affected by the lack of the necessary tools, materials, and equipment which
were so important to the war effort, industrial arts assumed many interim responsibilities which caused subsequent curriculum changes.

One of the major wartime objectives of industrial arts was the pre-vocational one. Prepared to work in harmony with vocational education programs geared to meet the demands of preparing skilled workers for the defense industries, industrial arts programs themselves often assumed vocational proportions.

A nationally celebrated wartime industrial arts undertaking was the Model Airplane Project sponsored by the United States Office of Education in cooperation with the Navy Bureau of Aeronautics. The program, designed to meet the demand for training models of allied and enemy aircraft, originally was implemented in the schools on an individual project basis with each student making a single model according to specifications. However, as the demand for the completed product increased, industrial arts shops adopted mass production techniques. Justified by a majority of industrial arts teachers as a definite industrial activity and certainly an important activity from the national security point of view, the Model Airplane Project involved 800,000 youths in 6,000 schools.

The post-war position of industrial arts was greatly influenced by wartime objectives. Some of the subsequent changes
made in industrial arts programs during the war were not to be readily abandoned at the war's termination. One of the more notable of these wartime carry-overs resulted from the prevocational stress placed on the curriculum area. The Manning Table Plan and the Dictionary of Occupational Titles were two aids which were largely responsible for the efficiency of preparation of defense personnel and which changed the subject matter of industrial arts programs.

The post-war years found industrial arts in great need of properly prepared instructors. It was at this time that the largest number of industrial arts teachers were simultaneously prepared than at any previous point in history. And not only were undergraduate enrollments high during the post-war period, but graduate enrollments also soared to unprecedented heights. It was at this time that the controversy regarding the place of laboratory courses in graduate study received increasing attention.

The fifth decade saw the introduction of new and revised industrial arts proposals. There were programs representing both philosophies prominent at the close of the previous decade.

In 1946 the American Vocational Association's Committee on Standards of Attainment in Industrial Arts Teaching revised the popular report printed in 1934. Titled Improving Instruction in Industrial Arts, the publication basically represented the views re-
garding industrial arts education of the original Committee on Standards.

At its first post-war national convention held in 1947, the American Industrial Arts Association featured a program of industrial arts entitled the New Industrial Arts Curriculum. Based on the philosophy deriving industrial subject matter from the industries, the program emphasized the relationship between technology and industrial arts education. One year after the AIAA program was featured, the Florida Plan was developed. This plan attempted to incorporate many of the features of the New Curriculum.

The fifth decade was a period of growth for the American Industrial Arts Association, an organization formed just prior to the close of the 1930's. With the adoption of a formal body of laws early in 1941, the association was to assume an influential position in the industrial arts profession.
CHAPTER VI

INDUSTRIAL ARTS IN THE 1950's

The sixth decade of the twentieth century introduced a period in history which was to encompass a rapid advance in technology. With the Second World War and its aftereffects fading into an unforgettable past, increasing attention was devoted to domestic activities. Technological innovations attracted widespread attention, and this rapid technological advance was to become one of the dominant factors in the promotion of industrial arts in the 1950's. Purportedly the curriculum area designed to reflect the technological progress of our country, much was to be written about technology and industrial arts and the place of both in the school curriculum.

Mass Production Stressed

One of the most significant innovations in the industrial arts program was the emphasis placed on mass production. Two basic philosophies emerged regarding mass production in the school shop. The first stressed mass production activities as a method of teaching; the second viewed mass production as a unit of study.
Mass Production as a Method. George R. Keane, from The City College of New York, described an approach to the study of industry using mass production as a method of teaching. In his subsequent booklet published by the American Industrial Arts Association, Teaching Industry Through Production, Keane stressed the use of production techniques in achieving many of the "illusive industrial arts objectives now believed in by many teachers." Keane stated that "organization for mass production is the industrial art. Industry is mass production -- even when automated. It is not the crafts, nor is it home or hobby activity."\(^1\)

There were six major parts to Keane's plan. The first two consisted of an introduction of the mass production approach by the instructor with a subsequent development of the idea through pupil discussion. It was during this time that such things as the importance of industry in our contemporary society, the place of mass production in this society, the economics of business, and the place of the producer and consumer were discussed. Various positions in an industrial organization were delineated; later in the program these positions were assumed by students participating in a mass production activity.

The third part of the program involved the organization of the class into units resembling the divisions of an industrial concern. Three students were selected, each to take charge of one major division including engineering, production, and management. The fourth part of the plan consisted of organizing for the actual production of a chosen product. During this phase of operation, positions necessary for production were determined and filled by student personnel. A pilot model was designed and made; after it had met with approval, the jigs and fixtures necessary for the ensuing mass production run were prepared.

Following the actual production of an article, sessions were scheduled during which time students received the opportunity to discuss the many problems which they encountered in the entire undertaking. Here the importance of even the seemingly trivial tasks could be reviewed. Following the completion of the first mass production activity, plans were structured for subsequent mass production experiences.

*Mass Production as a Unit.* Robert W. Haws, Professor, Industrial Arts Education, The Ohio State University, and Carl J. Schaefer, Associate Professor, Industrial Education, The Pennsylvania State University, described mass production as a unit of instruction in their publication *Manufacturing in the School Shop.*
The proposal by Haws and Schaefer included seven major phases. The first of these involved a study of the history of manufacturing and a review of the importance of manufacturing in present society. The second phase of the unit consisted of discussion and study regarding the growth of ideas. Specific objectives of section two were: "1. To learn how ideas grow, 2. To determine what projects could be manufactured in the school shop." ²

Section three of the unit involved an analysis of operations and procedures necessary to develop and manufacture a given object. The problem-solving approach was suggested in this assignment which included three steps: (1) the identification and statement of the problem, (2) determination of the obstacles to the solution of the problem, and (3) the implementation of the most tenable solution.

After the initial three steps had been completed and a product was defined, production methods applicable to the production of the project were developed. It was the goal of this part of the unit to "stimulate thinking about the designing of tools to accomplish multiple production," and to "learn the advantages of using production methods when producing large numbers of articles or parts." ³ Following this,


³Ibid., p. 24.
a plant layout was required. This not only necessitated study into the placement of machinery but it also called for thought concerning the "flow" of the product from its initial to its final stage.

The sixth section of the unit was devoted to a study of personnel organization for efficient production and included study of the importance of dependable and qualified line and supervisory personnel. The final section included a study of major "cost elements of raw materials, labor, and overhead," and the appreciation of "the American free-enterprise system from both the manufacturers' and retailers' viewpoints."  

There were many reports of mass production attempts in individual shops during the 1950's. Generally, the mass production experiences in the program were limited to a unit of study rather than a method of teaching. William S. Reynolds, State Teachers College, Oswego, described a mass production unit designed for a small shop. The basic steps involved in this unit were: the selection of a product suitable for manufacture in the small laboratory; the personnel structure, comprised of students in the class, to be responsible for the undertaking; and the determination of production methods to be used in manufacture. The experience was coordinated

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4 Ibid., p. 42.
with discussion regarding actual industrial problems and was climaxd
by a field trip to a large plant where mass-production techniques
could be observed first-hand. 5

Lloyd H. Wolf, an instructor at Arlington, Virginia, and
Wallace Roby, an instructor at Hyattsville, Maryland, discussed two
interrelated ideas concerning mass production and contemporary
industry:

(1) A primary purpose of industrial arts education is to
interpret to children and youth a dominant aspect of our
culture, namely, industry and (2) Mass production -- a
means of producing goods and services through a unique
arrangement of people -- is a basic element of modern
industry. 6

They further stressed that the educated man "in terms of contemporary
American culture" was not one who was ignorant of the fundamental
industrial principles, one of which definitely was mass production.

Wolf and Roby stressed the mass production experience in
the industrial arts program as a complete unit utilizing a specific
period of the school term. They stressed six criteria for the product
to be manufactured: (1) commercial value, (2) comparatively short

5William S. Reynolds, "Mass Production in the Small Shop,"
Industrial Arts and Vocational Education, XLII, No. 2 (February,
1955), 31-33.

6Lloyd H. Wolf and Wallace Roby, "The Line Production Job in Industrial Arts Teaching," The Industrial Arts Teacher, XVI,
No. 2 (November - December, 1956), 9.
production (measured in minutes), (3) complexity of tooling involved
to the point where students can be challenged but not frustrated by
the complexity, (4) number of production steps to total slightly less
than the class enrollment, (5) relatively long production run,
(6) small cost per item.

Thomas Spencer, an instructor at the Josephus Daniels
Junior High School at Raleigh, North Carolina, stressed the place of
mass production in teaching "democracy, teamwork, and respon-
sibility," in addition to providing pupils with knowledge of mass
production and its place in society. 7 Spencer emphasized the need
for three student committees in the mass production unit: an en-
gineering committee, a production committee, and a business
committee.

Spencer stressed the importance of providing students with
a successful first experience; to this end the following project criteria
were listed:

1. The finished project should have commercial value.
2. The production run should be finished in one period
   with adequate time remaining for an evaluation and cleanup.
3. Tooling should be involved. This tooling should be
   simple enough to be done by the students.

7 Thomas Darrell Spencer, "Mass Production in Industrial Arts,"
Industrial Arts and Vocational Education, XLVIII, No. 8 (August,
1959), 229.
4. The project should involve about 12-18 operations, all requiring about the same length of time.
5. The project should permit a relatively long run so the students can become proficient in their jobs.
6. The cost should be within every students ability to pay. 

Industrial Arts and Integration

The 1950's saw an increased demand for the integration of industrial arts with other curriculum areas, especially science and mathematics. There were a number of reasons for this desired integration. First, it was felt by a number of educators that the principles of industry could not be fully understood without a strong scientific and mathematical background. In fact, some felt that industrial arts was basically the application of scientific principles and as such it was in reality closely related to science.

R. O. Knight of the Columbus, Ohio, public school system expressed the views of many industrial arts educators when he stated:

Industrial arts education abounds with the practical application of the principles of physical science. Many teachers fail to identify the opportunities for correlating these subjects. The industrial arts shops may become

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8Ibid., p. 230.
excellent laboratories where the activities can serve as potent media to satisfy the curiosity of inquiring minds; where the practical applications of scientific principles can give depth to understandings.\textsuperscript{9}

Donald Maley, Professor and Head, Industrial Education Department, University of Maryland, also stressed the opportunity industrial arts had for the application of scientific principles. He indicated:

First we must accept the basic fact that mathematics and science are of extreme importance in a time when technology plays such an important part. But the fundamental error can be made if there is no opportunity for concrete application of the mathematics and science. This is the point where a truly significant contribution by industrial arts can be made.\textsuperscript{10}

Other educators felt that the integration of industrial arts with science and mathematics would give industrial arts the prestige it was lacking in the eyes of many laymen. Following the launching of Sputnik, there was an increased concern over the science and mathematics subjects; it was especially at this time that a relationship between these subjects and industrial arts was sought.

\textsuperscript{9}R. O. Knight, "Applied Science in Industrial Arts," The Industrial Arts Teacher, XVIII, No. 1 (September - October, 1958), 18.

\textsuperscript{10}Donald Maley, "Research and Experimentation in the Junior High School," The Industrial Arts Teacher, XVIII, No. 4 (March - April, 1959), 12.
The inclusion of science in industrial arts was not confined solely to public school programs. Andrew W. Paton from Kent State University discussed the need for including more science and mathematics education in the undergraduate industrial arts teacher education programs. Paton reasoned:

In its evolution from manual training to its present role of interpreting industry, industrial arts has moved from the simplicity of the frontier craft shop into the complex maze of scientific production. The teacher who approaches the job of explaining this complex without himself understanding the science involved is attempting the impossible.\textsuperscript{11}

Elementary Education

Industrial arts in the 1950's experienced an increased concern regarding the curriculum area on the elementary school level. Walter Klehm, Head, Industrial Arts Department, Eastern Illinois State College, indicated that two philosophies regarding the use of tools and materials on the elementary school level prevailed. The first philosophy presented handwork as a subject in itself; the second

\textsuperscript{11}Andrew W. Paton, "Upgrading of Science Training for Industrial Arts Teachers," The Industrial Arts Teacher, XVIII, No. 1 (September - October, 1958), 17.
presented handwork on the elementary level as "a device or method for teaching more effectively the regular school subjects."\(^\text{12}\)

Klehm indicated that the second philosophy was increasingly popular and stated:

The elementary school teacher has as her chief responsibility the development of the pupils in the use of the tool subjects (reading, spelling, arithmetic, etc.) common to all in a democratic society. Any skill developed by the children in manipulating tools and materials is merely a by-product of her chief efforts.\(^\text{13}\)

An outgrowth of Klehm's view was the problem of who should present the use of tools and materials to the students on the elementary level--the elementary school teacher who has received some industrial arts instruction or the industrial arts teacher prepared to teach on the elementary school level? Klehm indicated that "as a general observation, it is much more desirable that this work be conducted by the regular teacher than by the special teacher."\(^\text{14}\)

Four important factors for successful elementary school handwork were stated. First, there was the proper preparation of a teacher, regardless of whether a regular or special teacher was to

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\(^\text{13}\) Ibid.

\(^\text{14}\) Ibid., p. 212.
teach the subject. Second, there was a definite need for tools and equipment of the proper size so that children would have no difficulty handling needed equipment. The third factor related to adequate and proper storage of tools and materials, and finally, there was the consideration of proper instruction pertaining to the use of tools and materials.

Damon K. Kroh, a consultant in elementary industrial arts in the Roslyn, New York, public schools, described the elementary school industrial arts program as one which was generally taught by a traveling teacher as opposed to the secondary school type of program where the teacher remained in his own room. It was important, Kroh emphasized, that the elementary school industrial arts teacher be a true master of his profession since he did not have at his immediate disposal many of the facilities a teacher would normally have if he were teaching in a constant environment.

Kroh stated four basic concepts for a successful elementary school industrial arts program and referred to these concepts as

"The Four E's - experience, exploration, enrichment, and experimentation." Applying the above concepts to an existing elementary

school program, Kroh emphasized the strong relationship between industrial arts and other subject matter.

Teacher Education

The 1950's witnessed a continued controversy among industrial arts educators regarding the unit and the general shop facility. Not only did discussion pertain to the public school, but it also included the teacher education institution.

A Comprehensive Approach. In the second half of the decade a comprehensive general laboratory was designed and built at Montclair State College, New Jersey, which included eight broad areas of study: graphic arts, drawing, woodwork, arts and crafts, transportation, communication, power, and metal. The physical facility, developed under the leadership of Dr. Carl Frankson, evolved from a philosophical point of view which stressed the belief that teachers taught in the public schools, to a great extent, as they were taught during their higher education experience. Pointing to the fact that a large number of New Jersey schools had general shops but no major facility for preparing general shop teachers, it was the planning committee's feeling that a comprehensive laboratory on the teacher education level was the answer to preparing instructors who
could successfully teach in the existing and planned comprehensive facilities. It was strongly felt that a comprehensive facility would allow students to work on research projects without encountering the subject barriers confronted in the unit shop.\textsuperscript{16}

The Minnesota Plan. In 1958 the industrial education faculty at the University of Minnesota, under the leadership of Dr. William J. Micheels, published the results of a two-year study designed to prepare industrial arts teachers who would be capable of presenting an industrial arts program in the present and future technological society. Titled The Minnesota Plan for Industrial Arts Teacher Education, the proposal was the "first step to take us from where we are to where we think we ought to go" in the preparation of industrial arts teachers.\textsuperscript{17}

A number of assumptions were stated by the planning committee in order to present some guide for further work. These assumptions were grouped into four major divisions. First, assumptions were stated regarding the United States and the contemporary

\textsuperscript{16}Carl E. Frankson, "A Varied Approach to Teacher Training Facilities," Industrial Arts and Vocational Education, XLVIII, No. 10 (December, 1959), 312-16.

\textsuperscript{17}William J. Micheels et al., The Minnesota Plan for Industrial Arts Teacher Education (Bloomington, Ill.: McKnight and McKnight, 1958), p. 11.
world in which educators would be living. Specifically, assumptions were made "about the social, economic, and technological forces" which worked to shape the country and the world. Further, assumptions were made "with respect to education, including teacher education," "liberal or general education," and "both industrial arts and vocational-industrial" education.

The committee presented a number of theses regarding industrial arts to form the basis for curriculum developments. These theses descriptively defined the curriculum area:

1. Industrial arts is basically a laboratory subject.
2. The unique contributions of industrial arts are threefold:
   a. To help young people learn to solve problems by using the tools, materials, and processes of industry.
   b. To help young people learn how industry uses tools, materials, and processes to solve problems.
   c. To help young people develop means of personal communication, expression, and adjustment through the use of tools, materials, and ideas.
3. The industrial arts teacher must develop a thorough understanding of the basic principles which relate to the use of tools and materials. While acquiring an understanding of basic principles, he must also develop basic skills in using the tools and processes which are necessary in forming, shaping, and assembling materials.
4. The industrial arts teacher must have first-hand experience with the internal activities of industry. At the same time he must develop an awareness and understanding of the external relationships of industry to the culture in which he lives.
5. It is neither possible nor necessary for the industrial arts teacher to become highly skilled in using tools and materials for all areas encompassed by the term industrial arts. The undergraduate student should develop a variety of basic skills and understanding which he can put into practice on the operational level. He should acquire depth of experience in one or more areas of interest. With his understanding of basic principles he should later be able to acquire depth in other areas by working on his own.

6. The industrial arts teacher must be a problem solver "par excellence." He must be able to solve a wide variety of problems related to the use of tools and materials. In addition, he must be able to handle problems related to students, curriculum development, class organization, and curriculum implementation.

7. The industrial arts teacher must be acquainted with and understand the concept of "change" in a technological society. He should be able to cope with and direct change in this changing world.

8. The industrial arts teacher should desire, and be capable of, improving his own professional competencies through self-directed study, practice, and research.

9. The industrial arts teacher must be liberal in his outlook as he views local, national, and world forces and as he relates these to the work of industrial arts generally and his work with individual students specifically.

10. The industrial arts teacher must be well adjusted personally and have a wholesome and healthy outlook toward his society. This means that he must maintain a satisfactory personal life and be a contributing member of his society. 18

The curriculum was developed from the three traditional curriculum areas: general education, professional education, and specialized education or industrial arts subject matter preparation.

Probably the outstanding feature of the Minnesota Plan was the

18 Ibid., pp. 31-32.
breakdown of the industrial arts preparation into three "cores of experience," science-mathematics, technology, and design. Each core had specific functions. The science-mathematics core was to

1. provide the scientific basis for developing a thorough understanding of the tools, materials, and processes which will be studied in the technology core.
2. provide an understanding of mathematics and science as these relate to world and community problems and as they aid the individual in making intelligent personal decisions.\(^{19}\)

The technology core was to develop "the professional competencies required by an industrial arts teacher." Specifically, these competencies were related to the use of tools and materials and processes of industry. Some important points related to this area were:

1. The learning experiences in the technology core grow out of the basic scientific principles and the mathematical competencies developed in the science-mathematics core.
2. In this core the student develops the skills and understanding related to the use of industrial tools, materials, and processes.
3. The student gains an understanding of industrial organization and practices. He also studies the relationships between industry and society.
4. The skills and understanding of the technology core are then reinforced by their creative application in solving the problems of the design core.\(^{20}\)

\(^{19}\)Ibid., pp. 38-39.

\(^{20}\)Ibid., p. 40.
The third core, design, was to develop competencies needed by the industrial arts teacher, and at the same time, provides a bridge to courses in other disciplines. The term design, as used here, should be interpreted in its broadest sense.\textsuperscript{21}

The basic concepts encompassed by the design core were:

1. Design is concerned with creative problem-solving activities. . . .
2. There should be many opportunities for the student to analyze, synthesize, and evaluate as he learns to solve problems by making creative use of industrial materials, tools, and processes.
3. Careful attention is given here to the synthesis of skills and understandings developed in science-mathematics and technology -- a sort of "wrap-up" of previous experiences in terms of solving unique problems.
4. Emphasis in this core is on the creative organization of elements to fulfill human needs. The student should develop the ability to communicate and express ideas and feelings.
5. Experiences in the design core should help the student develop an understanding of the creative efforts men have made throughout the ages to express themselves. This should provide a bridge to the study of all the humanities.\textsuperscript{22}

The Minnesota Plan was one of the major recent attempts to plan a systematic approach to the study of industrial arts. Its most valuable contribution was in its recognition of the necessity of preparing teachers to teach contemporary industrial arts programs and then preparing them for this responsibility. This was a departure

\textsuperscript{21}Ibid., p. 42.

\textsuperscript{22}Ibid.
from many former proposals which attempted to propose a new curriculum without providing the necessary qualified teachers to implement the program.

Accreditation. The accreditation of teacher education institutions was a controversial topic relating to teacher education in general. However, of particular interest was the accreditation of industrial arts teacher education programs. Verne C. Fryklund, President of The Stout Institute, Menomonie, Wisconsin, discussed accreditation and industrial arts teacher education programs at the 1951 American Vocational Association Convention. Fryklund indicated that generally eleven major standards were evaluated by accrediting agencies: "purposes, faculty, curriculum, instruction, library, student personnel service, administration, finance, physical plant, institutional study, and athletics." Fryklund explained that the foregoing standards were stated in general terms and applied to the college or university as a whole. But he indicated:

In so far as industrial-arts departments are concerned now the most serious problem is with the standards relating to library and staff competency. Basic industrial-arts books are not included in the criteria, and special competency of the staff is not given consideration. 23

23Verne C. Fryklund, "Accreditation of Industrial Arts Teacher Education," Industrial Arts and Vocational Education, XLI, No. 2 (February, 1952), 36.
Regarding the importance and place of the advanced degree in industrial arts Fryklund indicated that such degrees are emphasized as a requirement, yet the doctorate is generally a scarce possession in industrial-arts teacher education and does not lend heavily to the over-all competency in the special field. In most instances the work for the doctorate is often of such nature as to tend to educate the holder away from the field.  

A number of problems immediately arise when the accreditation of industrial arts teacher education programs is discussed. These problems relate to (1) who or what body shall accredit the programs, (2) what philosophy or philosophies of industrial arts will be recognized, (3) how would teacher education programs preparing both vocational and industrial arts teachers be evaluated, and (4) what aims and objectives of industrial arts would be recognized by the accrediting group.

Research and Experimentation

The 1950's saw greater emphasis placed on research and experimentation in the industrial arts program. Donald Maley, Professor and Head, Industrial Education Department, University of Maryland, and the individual given credit for first implementing the

\[ ^{24}\text{Ibid.} \]
technique in industrial arts programs, stressed the importance of research and experimentation methods in industrial arts as the primary means for applying the principles of mathematics and science. He challenged:

Where else in the school is there the possibility for the integration and application of the mathematical, scientific, creative and manipulative abilities of youngsters to be applied in an atmosphere of references, resources, materials, tools, and equipment so closely resembling the society outside the school?²⁵

Maley identified research and experimentation in the industrial arts program as the place "where the gifted child meets the challenge of application and construction, where science becomes a reality and mathematics a tool." The concept of research and experimentation involved activities centered around "testing, analysis, and investigation of tools, materials, and processes" as opposed to the traditional programs which stressed the making of things.²⁶

The research and experimentation as described by Maley featured research activities including such basic materials as wood, plastic, metal, glass, and chemicals. These and many others were experimented with in many different ways, utilizing a predetermined plan of procedure.

²⁵Maley, p. 12.
²⁶Ibid.
At the end of the decade, Dr. Arthur Earl, Professor, Industrial Arts Education, Montclair State College, New Jersey, wrote a text entitled *Experiments With Materials and Products of Industry* which provided numerous examples and ideas regarding the research and experimentation technique in the industrial arts program. Earl stressed:

> Research and experimentation courses, structured around the materials and products of industry, could readily serve to develop in young people a desire to inquire, search, create, investigate, and explore many new concepts of life.\(^\text{27}\)

Earl stressed the difference between original research and research original to the student and indicated that the latter was the more important of the two. Eight advantages of the research and experimentation method were given: (1) The challenge the method presented to "explore the unknown"; (2) The experiences provided in "method, procedure, and equipment" which parallel industrial experiences; (3) The use of the "investigative approach" requiring students to examine many products and materials in addition to discovering and using many sound experimental techniques; (4) The fostering in "each student a type of freedom that helps to develop physical, mental, emotional, perceptual, and esthetic growth";

(5) The increased use of library facilities; (6) The possible contact with industrial organizations; (7) The emphasis on good writing.  

Earl's text divided illustrative activities into thirteen major areas and included experiments in auto mechanics, ceramics, electricity, finishing materials, fasteners, leather, drafting, metalwork, photography, plastics, textiles, and woodwork.

The increased emphasis placed on problem solving in the industrial arts laboratory was another highlight of the 1950's and was closely related to research and experimentation. Donald G. Lux, Associate Professor of Industrial Education, University of Illinois, summarized the feelings of many industrial arts educators when he stated that "industrial arts is in the forefront of the move to increase the emphasis on problem solving in the schools." He further stressed the fact that

greater recognition still needs to be given to the fact that the teaching of problem solving with contemporary materials, tools, and processes of industry, rather than with imaginary academic problems, is one of the valid justifications for the requirement of industrial arts as general education.  

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28 Ibid., pp. x-xi.

Lux identified four features of the problem solving method:

1. Active seeking of a pupil-teacher approved problem.
2. Having the pupil carry the primary burden in analyzing a problem, once it is identified, to find the most desirable solution.
3. Solving the problem, if possible, according to a pupil-developed and constantly-evaluated plan.
4. Pupil-teacher evaluation of the result.  

The American Industrial Arts Association

The 1950's saw the American Industrial Arts Association grow beyond its limits established in the previous ten years. During the sixth decade, three "auxiliary and affiliated groups" were established to meet the needs of specific groups in the field of industrial arts.  

The American Council on Industrial Arts Teacher Education.

Following the end of the war in the mid-forties, there was a rapid rise in the enrollments of industrial arts teacher educational programs. Concurrently, there was a large increase in the professorial ranks which prepared the needed industrial arts teachers. Feeling that this group of educators had specific problems and goals within the

30Ibid., p. 148.

field of industrial arts unique to those instructors engaged in preparing industrial arts teachers, a group of teacher educators proposed at the 1948 AIAA convention in Cincinnati the organization of a group within the association to represent teacher educators.

At the convention the Executive Committee voted to sponsor such a representative organization. It appointed John A. Whitesel from Miami University, Oxford, Ohio, and past president of the association, to head the development of the organization. At the 1950 convention Walter R. Williams from the University of Florida and past president of the American Industrial Arts Association was elected president of the new group called the American Council on Industrial Arts Teacher Education (ACIATE); Gordon O. Wilber from the State College for Teachers at Oswego, New York, was the vice-president.

Since its inception the ACIATE has been instrumental in producing many publications and directories of immediate interest to industrial arts teacher educators. Some of the finest professional literature has been published by the council in the form of its annual yearbook, the first of which was unveiled at the council's annual luncheon meeting held at the 1952 Chicago convention. By the close of the decade the growth of the ACIATE was such that it represented nearly 500 members. 32

32Ibid., p. 98.
The American Council of Industrial Arts Supervisors. Early in the decade it was recognized by the Executive Committee and many other members of the AIAA that there was a definite need for attracting more industrial arts supervisors into the organization if it was truly to represent the entire field of industrial arts. It was for this reason that a proposal was made at the second annual AIAA Executive Committee meeting held in Gainesville, Florida, in December of 1950, recommending "a separate organization of supervisors be formed to meet concurrently with the ACIATE." 33

Supervisors present at the Executive Committee meeting supported the proposal and, consequently, Merrill C. Hamburg, supervisor of industrial arts in the Detroit schools and the AIAA Second Vice-President for Supervision, was given the responsibility of programming a one-day session for supervisors to precede the 1951 AIAA convention. After contacting 860 industrial arts supervisors in the United States and Canada during the interim period, the all-day session, scheduled for May 2, 1951, was attended by 50 supervisors who formed the American Council of Industrial Arts Supervisors. The first president was Merrill C. Hamburg of the Detroit Public Schools; the vice-president was Kenneth W. Brown

33Ibid., p. 101.
of the Philadelphia Public Schools. The constitutional purpose of
the ACIAS was

"...the development and furtherance of industrial arts as a part of the educational programs in the United States and Canada, through the mutual assistance of its members in matters of organization, supervision and administration of programs of instruction."\textsuperscript{34}

The American Council of Industrial Arts State Association

Officers. Toward the middle of the sixth decade, there was a movement within the American Industrial Arts Association to promote a closer relationship between the association and regional, state, and area industrial arts associations. To this end it was suggested that an affiliated organization consisting of the secretaries of sub-national arts associations be created.

Advocates of such an organization officially petitioned the AIAA president, Gerald Baysinger, late in 1954 asking that a meeting be called of all association secretaries during the 1955 convention gathering at Atlantic City. Baysinger, after discussing the merits of such an organization, appointed D. R. Sherman, Recording Secretary of the Michigan Industrial Education Society, to organize and chair the proposed meeting. Representatives of industrial arts associations met as scheduled at the 1955 convention and elected Leo Ebbens of

\textsuperscript{34}Ibid., p. 103.
Kohler, Wisconsin, as chairman, and Cary L. Hill of Stillwater, Oklahoma, as vice-chairman.

Representatives of industrial arts associations met as scheduled at the 1955 convention. They officially formed The American Council of Industrial Arts State Association Officers and opened membership "to all officers of local, state, provincial and territorial associations of industrial arts teachers."35 Elected as chairman of the group was Leo Ebbens, of Kohler, Wisconsin, and as vice-chairman, Cary L. Hill of Stillwater, Oklahoma.

Position of the Program

Despite the advances made by the practical arts subjects in the American public schools during the first half of the twentieth century, the sixth decade still witnessed a far from complete acknowledgment of the need for such study in the general school curriculum. Leon Mones, Principal, Cleveland Junior High School in the Newark, New Jersey, school system, discussed the problem in a presentation at the 1951 Annual Convention of the American Industrial Arts Association in New York City. Mones spoke of an intellectual stereotype which existed in many communities of the time.

He indicated that "there still exists in most American communities the notion that education is the training of the intellect through some kind of logical discipline, through some kind of intellectual penetration." Mones stressed the importance of eliminating this stereotype in the community before industrial arts would be accepted as an educational subject deserving the full attention of all students.

Industrial arts educators in the 1950's were themselves discussing the perennial problem of the place of industrial arts in the school curriculum. Many articles were written attempting to encourage the strengthening of the position of industrial arts in local schools. Despite the general glowing reports of the growth of industrial arts programs, there was increasing concern over the curtailment of industrial arts activities in certain communities. M. Ray Karnes, Professor at the University of Illinois and President of the American Industrial Arts Association, cited four basic reasons for the diminishing industrial arts programs in some communities:

1. decrease in relative proportion of total school budget allocated to industrial arts, 2. increase in number of units of work required and thus a corresponding decrease in number of electives which may be pursued, 3. decrease

36Leon Mones, "Industrial Arts and the American Community," The Industrial Arts Teacher, XI, No. 1 (October, 1951), 1.
in number of clock hours of instruction in industrial arts
courses, and (4) increase in tendency to counsel pupils
away from industrial arts elective courses and into other
areas considered of greater importance.\textsuperscript{37}

Karnes indicated that a contributing reason for the decrease
in industrial arts offerings was the defensive attitude taken by indus-
trial arts teachers. He criticized the inability of many industrial arts
teachers and administrators to make constructive, critical surveys of
their programs which would enable existing programs to be strength-
ened and subsequently to attract more students.

\textbf{Aims and Objectives.} Although the industrial arts of the
1950's reflected a small number of new proposals, in practice there
was often little difference between the manual training programs
which stressed the importance of skill development and so-called
contemporary industrial arts classes. R. Lee Hornbake, then
Professor of Education at the University of Maryland, quoted one of
his former students who was at the time teaching a graduate course.
Discussing the objectives of industrial arts in the early fifties,
Hornbake indicated:

\begin{quote}
We are not lacking objectives and we are not lacking good
objectives. But we have not permitted these objectives to
have much influence on our teaching. For example, a very
\end{quote}

\textsuperscript{37}M. Ray Karnes, "A Major Problem in Education: Improve or
Perish," \textit{The Industrial Arts Teacher}, XIX, No. 2 (November-
December, 1959), 5.
widely read book in the field takes up and disposes of Industrial Arts objectives and the content of Industrial Arts in one easy chapter. In the beginning of the chapter the usual objectives are cited and they are briefly described. Then the pros and cons of a particular curriculum procedure are discussed. Next there is given an example of what may be the teaching content of Industrial Arts. However, the reader is not told how the author moved from objectives to content and the derivation is certainly not apparent.  

Alexander F. Bick, an instructor in the Milwaukee schools, discussing the goals of industrial arts urged the inclusion in the programs of more than skill developing activities. He stressed that for the satisfaction of the nation's and industry's needs the "practice of skill emphasis must recede in favor of other values that build men with the vision required to renew the nation."  

Bick criticized the antiquated aims and objectives of industrial arts of the period and further deplored the fact that "our aims are fifteen in number, according to some schools, and seven according to others. They are about as useful today as are fifteen steering wheels in a car." He further argued:

'Worthy home attitudes' is not an aim. 'Esthetic appreciation' is not an aim. 'Interest in achievement' is not an aim. These and others are effects of an unstated aim. This lip service to real purpose only amazes our critics, clouds the issue, and wastes the nation's resources. \(^{40}\)

G. Harold Silvius from Wayne State University in discussing the aims of industrial education in the American schools, stressed that industrial arts on the elementary school level (grades one through six) should provide the opportunity for all children to express themselves creatively and learn about different materials by constructing two or three-dimensional projects. Such activities should be closely correlated with the basic units for elementary education so that the results will be an integrated program of instruction. Industrial arts activity should serve as the correlating function between student ability groupings and the subject areas of social studies, science, and language arts. \(^{41}\)

Silvius identified three general objectives of industrial arts in junior high schools indicating that such education "should be maintained in multiple-activity shops by professionally qualified industrial arts teachers" and should provide

1. general basic exploratory experience in woodworking, metalworking, electricity, power mechanics, graphic arts, drafting, and industrial arts.

\(^{40}\)Ibid.

\(^{41}\)G. Harold Silvius, "Functional Aims for Industrial Education in American Schools," The Industrial Arts Teacher, XIX, No. 2 (November - December, 1959), 11.
2. . . . opportunity for students to assume responsibility in organizing and maintaining industrial arts activities, to develop safe work habits and desired interpersonal relationships in work situations.

3. . . . information about industrial and related occupations, to provide for an understanding of American industry for educational and vocational guidance of youth. 42

On the high school level Silvius emphasized the need for industrial arts programs which "provide a comprehensive curriculum to meet the specific needs of students with varying abilities, aptitudes, desires, and interests." This program was to be one which would serve the student who has "a burning interest in one or more of the industrial arts activities," the student who is interested in entering a vocational program, and the student who is going to college to study in such fields as industrial chemistry, electricity, hydraulics, instrumentation and automation. Silvius also stressed an industrial arts program "that includes a home planning course to help young men and women develop skills and insights needed to intelligently plan for their homes." 43

The 1950's saw an increasing concern over the place of industrial arts in the education of both slow and fast learners. Arthur A. Dick, Supervisor of Vocational Education and Industrial Arts in the

42 Ibid., pp. 11-12.

43 Ibid., p. 12.
Baltimore County Public Schools, stressed seven key solutions in successfully teaching industrial arts to slow learners:

1. Simplify teaching as to terminology, dimensions, operations, procedures.
2. Projects should be practical and within the pupil's ability.
3. Provision should be made for the success of the slow learner.
4. Individual instruction is still an up-to-date method for teachers to use.
5. More time and repetition are needed for reasonable results.
6. The teacher should understand and know a lot about the individual pupil.
7. Manipulative work is a natural for the slow learner.\(^\text{44}\)

Not only was industrial arts stressed for the mentally underprivileged students. Increased attention was being given to the place of industrial arts in educational programs for physically handicapped students. Harold H. Punke of the Alabama Polytechnic Institute thoughtfully discussed the place of handicapped persons in an article in *Industrial Arts and Vocational Education* in 1958.\(^\text{45}\)

The AVA Guide. In 1953 the American Vocational Association's Industrial Arts Policy and Planning Committee published a

\(^{44}\)Arthur A. Dick, "What Can We Do for Slow Learners," *Industrial Arts and Vocational Education*, XLVI, No. 4 (April, 1957), 118.

revision of its earlier publication, *A Guide to Improving Instruction in Industrial Arts*. Originally published as the report of the Committee on Standards in the early 1930's, the revised guide stressed many of the objectives and ideals stated in former American Vocational Association publications.

The scope of the industrial arts program was defined to include the study of "the materials, tools and processes of industry; science and invention applied to industry; the social and economic contributions of industry; and the human relations patterns fostered by industry."46

Nine objectives common to all industrial arts areas were suggested, but it was stressed that specific program objectives be determined by each teacher in light of specific pupil needs and physical facility limitations. The nine objectives follow:

1. Interest in Industry.
2. Appreciation and Use.
4. Cooperative Attitudes.
5. Health and Safety.
6. Interest in Achievement.
7. Orderly Performance.
8. Drawing and Design.
9. Shop Skills and Knowledge.47


47 Ibid., p. 18.
Three distinct industrial arts facilities were identified: the comprehensive general shop, "a type of organization which provides equipment and facilities for activities in two or more industrial areas"; the limited general shop, having many of the features of the comprehensive shop but limiting the activities and facilities "to work with a single basic material such as metal or wood, or to a closely related group or family of industries such as the electrical industries"; and the unit shop, a facility "usually limited to activities in a single industrial occupation." 48

In general, the 1953 edition of the AVA Guide contained much of the traditional material emphasized in previous editions.

Critical Thinkings. During the 1950's there was existing concern regarding the idealistic industrial objectives established by leaders in the field and the inadequate methods available with which to determine to what extent these objectives were fulfilled. For the most part, grading and evaluation of industrial arts work was still done by an evaluation of the finished project, which in turn reflected the student's acquired or innate skill. But industrial arts educators were insisting that their curriculum area was more than the mere skill development some critics claimed it to be.

48Ibid., pp. 30-32.
Much emphasis was being placed on the objectives concerned with behavioral changes which took place in the student during his tenure in an industrial arts class. Francis J. Kafka, an instructor of industrial arts in the New York City schools, acknowledged the importance of such objectives, but in an article examining the existing evaluation techniques he urged that objectives dealing with behavioral changes were meaningless if methods of honest evaluation were not established. Kafka particularly stressed the objectives which related to the development of consumer knowledge, appreciation of good design, and recreational or avocational interest; he advocated the need for research to develop instruments which would enable the teacher to evaluate student progress toward the fulfillment of these objectives. 49

While many industrial arts educators disputed the thinking of such men as Kafka, there was much evidence that the development of skill applied to the fabrication of an excellent project was still the quality most frequently and most highly rewarded. An exemplification of such recognition may be seen by reviewing the standards upheld by the countless committees established to organize and operate the industrial arts exhibitions and contests.

49 Francis J. Kafka, "A Challenge to Industrial Arts Teachers," The Industrial Arts Teacher, XII, No. 1 (October, 1952), 16-17.
Speaking before a group of educators at the National Education Association National Assembly in 1955, Burl M. Osburn, Head, Department of Industrial Arts at the State Teachers College, Millersville, Pennsylvania, warned against the promotion of a number of "fragmental concepts" of industrial arts instead of the promotion of the entire professional offerings. Some of the concepts referred to by Osburn follow: "The 'make something to take home' concept" which, while being the local result of industrial arts program promotion, was given authoritative support by the many texts published in the field. Concerning the concept which promoted exhibitions and "contest-winning," Dr. Osburn indicated that the finished project in most contests and exhibitions was designed to "satisfy the experts who do not even know the maker, or what education he has gained." Dr. Osburn also discussed the "'personal likes'" concept in which the teacher promotes only those areas of the industrial arts program in which he is skillful or those which he likes; the "'pre-vocational'" concept, perhaps the most pertinent example of a fragmentation of the industrial arts program; the stress of industrial techniques and processes to the extent where the shop is designed to look like a factory; the "'dumping ground'" concept which emphasizes the importance of industrial arts in the education of students who are considered discipline problems to the school administration; and the concept which exploits
the industrial teacher and students by emphasizing the importance of industrial arts in the maintenance of the school. 50

The Electronic and Sputnik Impact. Perhaps the event which was to affect education as a whole more than any other occurrence during the sixth decade was the launching of Sputnik. In search of reasons why the United States was not the first to launch such a space vehicle, many critics looked to education to find causes of failure.

The launching of Sputnik had a mixed effect on industrial arts education. In some areas, especially in those where school curriculums underwent severe scrutiny to eliminate all "frills," industrial arts was labeled a curriculum area designed to meet the needs of the academically deficient student. The making of objects was not looked upon by evaluators as necessary in the preparation of the college-bound student.

Critics sympathetic to industrial arts education pointed to a common fallacy which gave credit for the implementation of scientific principles to scientists and mathematicians only. These individuals emphasized the fact that technically competent men were needed to fabricate the scientist's ideas. Partially the result of such reasoning, areas of industrial arts experiencing the most growth in the years

50 Burl M. Osburn, "Industrial Arts in Modern Education," The Industrial Arts Teacher, XV, No. 2 (December, 1955), 6-7.
following Sputnik were electricity and electronics. Since the end of 1957, a multitude of teaching aids have been developed for teacher and student use in this area.

C. A. Wiken, Vice-president, Rockwell Manufacturing Company, in discussing the implications of the electronic age for education emphasized that

there is a missing link in the chain of education and training that runs from the elementary school to the university doctoral thesis. This missing link has resulted in a void in our manpower resources that is becoming more critical every day. The missing link is an advanced, more sophisticated technical education that combines the abilities of the mind with the capabilities of the hands. The void in manpower resources is the lack of a class of personnel sufficiently hand-skilled to translate abstract ideas into three-dimensional reality. 51

Wiken indicated that the breadwinners in today's society were classified "according to the degree with which they must deal with abstract ideas or with physical things requiring expenditure of physical rather than mental labor." He discussed various jobs and positions along this scale and pointed to the void resulting from the fact that "there is no group that attempts to combine mental training with hand training." 52 The importance of having the manual ability to

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52 Ibid., p. 9.
transform theory into reality was cited as being extremely necessary in the creation of new designs and functional implements not because the designer is called upon to fabricate the original model but because the designer must know whether his proposal can be fashioned from available materials. Wiken noted the place of industrial arts in providing the missing link in the occupational scale.

A Federal Study. Late in the sixth decade, a study was undertaken by the United States Office of Education to determine the "nature, scope, and sequence of industrial arts education in the public schools of the United States." The research involved the examination of thirty-nine published state curriculum guides for industrial arts from twenty-two different states.

The study reported on seven areas of industrial arts: "(1) drawing and planning, (2) woodworking, (3) metalworking, (4) electricity and radio (electronics), (5) graphic arts, (6) transportation and power mechanics, and (7) plastics."

Results indicated that industrial arts on the elementary school level provided experiences in construction-type activities which were closely correlated with other school subjects. On the junior high

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54 Ibid., p. 64.
school level industrial arts was found to provide a broad exploratory experience which formed the base for further industrial arts and related study. The senior high school industrial arts program offered "greater depth of experience in one or more subject areas, such as, electricity and radio (electronics), graphic arts, and woodworking."  

Instructional topics most emphasized were those dealing with (a) project planning, (b) hand-tool techniques and machine processes, (c) technical information dealing with properties of materials and industrial processes, and (d) occupational information.

Less emphasis was found to be placed on topics that relate to modern industrial developments and problems, such as, automation, jigs and fixtures, and other mass production devices, practices, consumer problems, new products, and processes (such as, semiconductors, atomic-electric plant), and human relationships.

From this report it is apparent that the influence of the trade analysis philosophy of industrial arts prevailed over the comprehensive approach which attempted to study industrial processes and related information.

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55 Ibid.
56 Ibid., p. 66.
57 Ibid.
Summary

The industrial arts program of the sixth decade was affected by the pace of the post-war technology. As a result of changes in industrial processes and techniques, industrial arts programs began to assume more than ever the responsibility of conveying this phase of society to students.

One of the more significant results of this emphasis was the enlarged introduction of mass production experiences into industrial arts programs. Two basic philosophies emerged regarding mass production in the school shop. The first stressed mass production activities as a method of teaching; the second viewed mass production as a unit of study.

Another result of the growing complexity of technology was the attempted integration of industrial arts with other curriculum areas, primarily mathematics and science. Advocates of such integration emphasized that industrial arts was actually the application of scientific and mathematical principles. Other advocates of the movement appeared to be concerned about augmenting the prestige of industrial arts.

Greater attention during the 1950's was given to industrial arts on the elementary school level. The problem of major concern
relating to this level of industrial arts education revolved around the proper and adequate preparation of the teacher. Teacher education of industrial arts instructors as a whole was confronted with the recurring problem of the comprehensive versus the unit facility as the best laboratory for preparing industrial arts teachers. The outstanding example of a comprehensive facility and accompanying program was the one established at Montclair State College, New Jersey. However, this type of facility and program was in the minority in the 1950's since the consensus definitely favored the unit shop program.

A plan for the preparation of industrial arts teachers which represented a new departure in teacher education originated at the University of Minnesota. Called The Minnesota Plan, it was based on a number of assumptions regarding the domestic and international society and the place of education, both general and specific, in this surrounding. The Minnesota Plan featured three cores of instruction in the specialized part of the teacher education program: science-mathematics, technology, and design.

Another outstanding change in the industrial arts program of the sixth decade was the emphasis placed on research and experimentation experiences. A number of such experiences were described in the literature of the period. Stress was placed on research
and experimentation techniques in the application of mathematical and scientific principles.

The American Industrial Arts Association increased the scope of its operation in the fifties. During the decade affiliated groups were established to represent the specific needs of industrial arts groups with special interests. These groups were the American Council on Industrial Arts Teacher Education, the American Council of Industrial Arts Supervisors, and the American Council of Industrial Arts State Association Officers.

Despite the innovations reported in the industrial arts programs of the fifties, there was much evidence that the majority of such programs were limited to the traditional activities. Although glowing objectives were used to illustrate the hoped-for situations, there was criticism from members in the field regarding the lack of progress industrial arts educators had made in the implementation of such objectives. The federal study made at the end of the decade verified arguments which insisted that industrial arts education was not a study of modern industry in most instances, but was a subject area which stressed to a great extent project planning, hand-techniques, and machine processes.
CHAPTER VII

THE PRESENT POSITION OF INDUSTRIAL ARTS

Industrial arts in the 1960’s finds itself in a school curriculum attempting to satisfy the needs of a multitude of students. There seem to be a number of influential forces acting both favorably and unfavorably on the curriculum area; some of these forces evolved from formal philosophies and doctrines. Three of these philosophical views are prevalent in educational thinking today: rationalism, naturalism, and analytic philosophy. From these doctrines two views regarding the place of industrial arts in the school curriculum have evolved. First, there are those individuals who, reacting to the pressures of this rapidly moving era, feel that the public school has an obligation to prepare each student to live successfully in the world and seek to accomplish this end by eliminating all the so-called frill courses and devoting as much time as possible to the traditional courses. Second, there are those who feel that in order to be truly liberally educated, a student must have an abundance of real experiences, an education consisting of more than mere book learning.
Industrial arts of the 1960's has inherited a mass of objectives and goals. While some of these are specific and meaningful, others are extremely general and could successfully be applied to all curriculum areas of the educational program. A review of the pertinent material makes it apparent that the objectives stressed by members of the profession are extremely varied.

A Federal Conference Report

In the middle of 1960 the United States Commissioner of Education, Sterling M. McMurrin, called a two-day conference in the nation's capital to present material and to discuss existing problems and issues related to industrial arts education. The conference was attended by many individuals in positions of leadership in the profession. Among them were Paul T. Hiser, Professor at State University of New York Teachers College, Oswego; Ivan Hostetler, Head of the Industrial Arts Department, North Carolina State College; John A. Jarvis, Dean of the School of Industrial Education, Stout State College; M. Ray Karness, Professor at the University of Illinois; G. Wesley Ketcham, Consultant in Industrial Arts, State Department of Education in Connecticut; Edwin L. Kurth, Consultant for Industrial Arts, State Department of Education in Florida;
Donald Maley, Head of the Industrial Education Department at the University of Maryland; Delmar W. Olson, Head of the Industrial Arts Department at Kent State University, Kent, Ohio; Marshall L. Schmitt, chairman of the conference and Specialist for Industrial Arts, United States Office of Education; and Robert L. Woodward, Consultant in Industrial Arts Education, State Department of Education in Sacramento, California.

R. Lee Hornbake, Vice-President in Charge of Academic Affairs at the University of Maryland, while not in attendance at the conference, prepared the first working paper of the report discussing the place of industrial arts in the American culture. In this report, Hornbake identified industrial arts as a curriculum area encompassing "a segment of man's knowledge representative of his finest achievements, namely his capacity to create and perform techniques."¹ Developing this idea Hornbake stressed the importance of a knowledge of "the ways of industry" when referring to almost any aspect of American life including "matters of national defense, of community and personal health, of communication, of transportation."

Regarding the objectives of industrial arts, Hostetler indicated the need for specific objectives for industrial arts programs at various educational levels and for slow and gifted learners. However, Hostetler indicated that subsequent objectives should supplement the following four major objectives:

1. To develop in each student an insight and understanding of industry and its place in our culture.
2. To discover and develop talents of students in the technical fields and applied sciences.
3. To develop technical problem-solving skills related to materials and processes.
4. To develop in each student a measure of skill in the use of the common tools and machines.  

The importance of manipulative skills were considered important "only as they are used in achieving the major goals of industrial arts education."  

Curriculum content for industrial arts courses was to be derived from technology. Relating to the origin of subject matter, the following interpretation was presented:

Industrial arts is a study of the technology, its origins and development; its technical, consumer, occupational, recreational, social, and cultural nature; and its influences through experimenting, creating, designing, inventing, constructing, and operating with industrial materials, processes, and products. Its purposes are to acquaint the stu-  

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2 Ibid., pp. 19-20.
3 Ibid., p. 21.
dent with his technological environment and to aid him in the discovery and development of his own human potential. 4

The derivation of curriculum content, developed by Olson, reflected many of the thoughts expressed earlier in his Ph. D. thesis, in the subsequent Epsilon Pi Tau publication, Technology and Industrial Arts, and in his text, Industrial Arts and Technology. The proposed industrial arts curriculum was a continuing program, beginning with the elementary grades and continuing through the senior high school.

In the conclusion of its report, the members of the conference recommended that

1. . . . industrial arts teachers, supervisors, and teacher educators critically analyze their past performance with the aim of providing better instruction and inaugurating pilot programs that can test new ideas.

2. . . . a coordinate effort be made to attack professional problems on a "cluster research basis."

3. . . . teacher-education institutions provide for more programs for inservice education and for curriculums at the undergraduate level so that students can specialize in specific programs.

4. . . . the U. S. Office of Education consider having meetings such as this on a continuing basis, not every year, but periodically.

5. . . . the working papers and proceedings of this conference be published so that others working in the field can share some of the ideas and points discussed here at the U. S. Office of Education.

6. . . . the U. S. Office of Education issue a call to the profession to stimulate teachers to attack their pro-

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4Ibid., p. 23.
fessional problems vigorously and that State and local groups throughout the country hold a series of small conferences.

7. . . . the U.S. Office of Education publish a short release to the profession summarizing the conference as soon as possible. 5

The ACIAS Report

Another recent attempt to define and identify industrial arts in the present schools and colleges was made by the American Council of Industrial Arts Supervisors of the American Industrial Arts Association. ACIAS views were formally presented in the subsequent publication, Industrial Arts Education. Written with the assistance of over 130 teachers, supervisors, and teacher educators from the United States, Canada, and the Philippine Islands, this publication is devoted to industrial arts purposes, program, facilities, and instruction.

Industrial arts was defined as "that part of the total program of education concerned with providing youth an opportunity to study about and to use tools, materials, and processes of industrial-technical fields." 6

5Ibid., p. 64.

Industrial arts was classified as a "subject field" consisting of areas "composed of a number of closely allied activities from an industrial-technical field." Metalworking was identified as being exemplary of an industrial arts area. Within each area were "sub-areas"; a subarea was defined as "a subdivision of an area and represents a branch of an industrial-technical field." Examples of sub-areas in metalworking are art metal, forging, and sheet metal.

Three major kinds of shop organization were identified: the unit shop, "organized and equipped to provide instruction in a single subarea of industrial arts such as cabinet-making, metal machining, or sheet metal"; the limited general shop, "organized and equipped to provide instruction in two or more subareas of industrial arts," such as bookbinding, linoleum block printing, and photography; the comprehensive general shop, "organized and equipped to provide instruction in two or more areas of industrial arts such as drafting, electricity-electronics, and metalworking."

Four purposes of industrial arts, closely resembling the objectives listed in the federal Conference Report of 1960, were stated:

To develop in each student an insight and understanding

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7 Ibid.
8 Ibid.
of industry and its place in our society.
To discover and develop student talents in industrial-technical fields.
To develop problem-solving abilities related to the materials, processes, and products of industry.
To develop in each student skill in the safe use of tools and machines.\(^9\)

Regarding the industrial arts program on different educational levels, industrial arts in the elementary school was described as being designed to further educational objectives and to enrich the experiences pupils have in attaining them. The activities in industrial arts place emphasis upon the planning and construction required in meeting needs that arise as pupils participate in social studies, science, mathematics, and language arts activities.\(^10\)

Industrial arts on the junior high school level was designated as primarily an exploratory program designed to provide each student with a variety of experiences in the various areas of industrial arts. It is at this level of education that the study of industrial arts is undertaken by more students than at any other educational level. On the senior high school level, industrial arts was to serve students generally on an elective basis, enabling pupils to acquaint themselves with industrial areas which they may not have had the opportunity to

\(^9\)Ibid., pp. 4-5.

\(^10\)Ibid., p. 10.
study on the junior high school level or to participate in deeper study in one particular area or areas. It was urged that "students have experiences in each of the industrial arts areas available in the school before they are encouraged to select an area for concentration."\textsuperscript{11}

Industrial arts on the college level was identified as having four basic functions:

(1) providing broad general education courses for all college students, (2) offering specific service courses for other college majors, (3) preparing industrial arts teachers, and (4) providing professional technical training for industry.\textsuperscript{12}

Instruction in industrial arts and descriptions of course content were divided into four major levels "identified as Level I, Exploratory; Level II, Basic; Level III, Intermediate; and Level IV, Advanced." The different levels represent "levels of complexity" of content material.

\textbf{Industrial Arts and Technology}

In addition to the formal reports representing groups of industrial arts educators and administrators, there have been a number of significant proposals regarding the teaching of industrial arts

\textsuperscript{11}Ibid., p. 8.

\textsuperscript{12}Ibid., p. 9.
made by individuals in and out of the profession. Some of the most challenging and controversial positions have come from such proposals.

Perhaps the most recent proposal with the greatest potential for achieving the broad objectives of industrial arts envisioned by Bonser and his followers came from Delmar W. Olson, Head of the Industrial Arts Department at Kent State University. In his publication _Industrial Arts and Technology_, based on an earlier doctoral study, Olson proposed an industrial arts program deriving its content from technology which was referred to as "America's Primary Resource."

Defining technology, Olson partially referred to Dewhurst's description:

> As technology consists of accumulated knowledge, techniques and skills, and their application in creating useful goods and services, the ultimate fruits of a country's technology are found in the standard of living its people are able to enjoy.\(^\text{13}\)

Because technology provides "man's physical and material needs," technology is America's resource and since technology "is built on the utilization of man's primary aptitudes, his creative imagination,\(^\text{13}\)

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and his tool-using dexterity, "technology is this country's primary resource."

The derivation of subject matter in Olson's industrial arts program was based on an analysis of industries. Seven major categories of subject matter were listed: manufacturing industries, composed of the ceramics, chemicals, foods, graphic arts, leather, metal, paper, plastics, rubber, textiles, tools and machines, and woods industries; construction; power; transportation; electronics; industrial research; and industrial management.

Olson opposed many of the traditional industrial arts objectives which he felt stress mainly the development of skill. He doubted that such objectives "show concern for the development of the total of industrial arts and of the total of the student." Instead he stated his goals for industrial arts in the form of functions, reflecting some of the proposals expressed earlier by Bonser and later in The Ohio Prospectus. Six functions were listed: "the technical, the occupational, the consumer, the recreational, the cultural, and the social."

Regarding the place of the project in industrial arts, Olson

\[ ^{14} \text{Ibid.}\]
\[ ^{15} \text{Ibid., p. 163.}\]
\[ ^{16} \text{Ibid., p. 165.}\]
stated that it is

neither means nor ends alone; it is both. It functions as one of the means for achieving the values of industrial arts, and thereby becomes a goal in itself. What the pupil does to the block of wood or chunk of clay is important because it is a strong measure of what that wood or the clay is doing to him. 17

Olson indicated that the project should have three dimensions: the technological dimension reflecting the materials, processes, quality standards, and economics of technology; the human dimension reflecting human resources, responsibility and potential; and the professional dimension, reflecting the technology, the students and the profession.

There are many challenging and worthwhile proposals presented in Olson's text. However, this work must necessarily be the first part of an integrated movement if Olson is to achieve any degree of success with his program. Although Olson envisions an industrial arts program which will introduce the child to the technological society in the elementary school and subsequently build on this initial experience throughout his educational tenure, a teacher on the secondary school level cannot design a program based on the precepts until something is done to insure each secondary student a minimum

\[17\] Ibid., p. 262.
level of industrial arts work prior to entrance to high school. The teacher in the field, no matter how zealous he may be, cannot possibly do justice to himself or Olson's program unless he is given some positive direction and guidance to this end. The present material available to industrial arts teachers does not readily give this teacher the necessary information needed to prepare the subsequent program. Mere words, while possibly arousing the masses for a short period, will not develop courses of study and the necessary teaching material. The *Ohio Prospectus* was written for the "progressive teacher." However, it soon became apparent that mere terminology did not rally even the progressive teacher to unprecedented ends.

**Conant's Influence**

One of the most influential men regarding American education in the past decade has been James B. Conant. Interpreting Conant's reports has become a popular activity; educators representing various curriculum areas have attempted to find solace in Dr. Conant's remarks concerning the importance of their fields. Industrial arts educators are no exception to this, and in the last few years a number of Conant's writings have been scrutinized to
defend the place of industrial arts in the school curriculum.

Looking at the education of our country's youth with a critical and purposeful view, Conant's writings have been regarded by some as having strong implications for industrial arts. But despite the glowing interpretations of Dr. Conant's writings regarding industrial arts, his view of industrial arts emphasizes only one of the major objectives of the discipline, namely the prevocational purpose. Conant feels that

The line between the industrial arts program and the vocational shop program for boys is not an easy one to draw. One may say that the industrial arts program provides a survey of the different skilled trades involving the use of tools and the working of materials as diverse as leather, wood, and metal. In the schools in which there are strong vocational shop programs for boys, the industrial arts courses can be considered as preparatory or exploratory courses.\textsuperscript{18}

Conant goes on to indicate that from his observations of the public schools "the whole atmosphere in the industrial arts shops was more professional in those schools which had strong vocational programs than it was in the schools which did not."\textsuperscript{19} Conant described the presence of a vocational education program as a stimulus to the stu-


\textsuperscript{19}Ibid.
dent enrolled in the industrial arts programs in the same manner as a college-level course in the twelfth grade program would be a stimulus to a college-bound student.

Dr. Conant placed a great emphasis on vocational education programs and stressed that such programs should provide the bulk of experiences with tools and materials related to industry. He has implied a severe need for proper and adequate vocational guidance of all youth, stressing a strong need for the acquirement of a saleable skill for students who are not going to continue their education beyond the high school level.

Dr. Conant's remarks concerning the education of American youth, especially his recommendations for improving secondary education, definitely have implications for industrial arts beyond those related to the prevocational objectives. The unfortunate part is that very few people today, besides those directly associated with some phase of industrial arts education, are aware of these implications.

Additional Objectives

One recent statement of definition and objectives of industrial arts was developed by a group of teachers in a summer workshop at the University of Pennsylvania under the direction of William
T. Kelly, an assistant director of vocational and industrial arts education in the Philadelphia schools. These teachers defined industrial arts as

that part of general education which provides study of the industrial and technical aspects of our economy. It involves laboratory and research experiences in the organization, tools, material, processes, and social problems of modern industry. 20

Eight major objectives of industrial arts were derived:

(1) exploration of industry, (2) development of an appreciation of good design and craftsmanship, (3) development of creative expression, (4) development of safe working habits, (5) development of skill in the use of tools and materials, (6) development of recreational and avocational interests, (7) development of consumer knowledge, (8) provide occupational information (guidance), and (9) development of healthy social relationships.

This group strongly recommended the assignment of outside work to industrial arts students, thus allowing more time to be devoted to the use of laboratory facilities while in school. In addition, there was a strong emphasis placed on the application of mathematics and science principles to industrial arts work.

William J. Micheels, President of Stout State College and President of the American Industrial Arts Association during the period 1961-62, wrote in a recent American Industrial Arts Asso-

ciation bulletin that the "ingredients" of industrial arts education are "tools, materials, ideas." Micheels listed three unique objectives of industrial arts education:

1. Helping people learn to solve problems by using the tools, materials, and processes of industry.
2. Helping people learn how industry uses tools, materials and processes to solve problems.
3. Helping people develop means of personal communication, expression, and adjustment through the use of tools, materials and ideas.²¹

Reflecting contemporary thinking on industrial arts education, Micheels emphasized that

Industrial arts is more than thing-making. It includes much in addition to tool-using. Though many enjoy using tools to make things, the value of the industrial arts shop is not limited to such enjoyments. The student should be forming, shaping, assembling and experimenting with ideas as well as with hand tools, materials, machines, and projects.²²

A review of the present periodicals devoted to the industrial arts profession shows that increased attention is being given to many of the points stressed in the 1950's. Some of these include an increasing emphasis on mass production in the industrial arts laboratory, the place of research and experimentation in the program, the place and application of the problem-solving technique, the in-

²²Ibid., p. 2.
tegration of industrial arts with other curriculum areas, and the study of automation.

A Look to the Future

Robert Swanson, Professor of Industrial Education at Stout State College and one of the more prolific writers in the industrial arts profession today, presented his views on what industrial arts should be in the years to come. Addressing the Iowa State Education Association at the Iowa State Education Association Convention in Des Moines in October, 1961, Swanson based his discussion on two fundamental assumptions: first, "that industrial arts should be the study of industry and technology" and, second, "that the gap between the specifics taught in the school and those applied in life will become greater and greater."23

Swanson went on to discuss three issues to face industrial arts of the future. The first of these related to activity in industrial arts; according to Swanson "industrial arts of the future will make improved use of activity in its teaching and its content." Examining one aspect of activity Swanson indicated that the degree of emphasis

placed on the development of skill in industrial arts will be determined by the reason for skill development. In the industrial arts of the future, "the skills developed must contribute to the understanding of industry and technology and not be justified on their own."  

Still discussing activity in the industrial arts program, Swanson drew a "ludicrous analogy" between chemistry and industrial arts, showing how the former would be taught if it were presented as many industrial arts courses are taught. The project was a pint bottle of amonia water.

The instructor would demonstrate how to perform the operations and give lectures on the related topics. He would point out that amonia water is useful for washing windows at home. The students would master the operations and produce a pint of amonia water. It would be proudly displayed at home but not used for washing windows because the boy's mother would want to keep it as a memento of her son's lab work. Students would ask to come in during extra periods to make more pints of amonia water. And next year they would sign up for advanced chemistry to make gallon bottles of amonia water.  

The second issue related to the responsibility for learning; Swanson indicated that "in industrial arts of the future methods of instruction will increasingly shift the responsibility for learning from the instructor to the student."  

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24 Ibid., p. 2.
25 Ibid.
26 Ibid., p. 3.
nique, recently receiving much attention in the field of industrial arts, was cited as one of the more promising approaches. The importance of student-directed learning was emphasized in a technological society where specific facts become outdated and obsolete rapidly.

The third issue was related to concept teaching. Based partially on the findings of a conference on education held at Woods Hole, Cape Cod, in 1961, which disclosed the belief that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development." Swanson stated that the "industrial arts of the future will teach at lower levels many concepts now reserved for advanced levels."\(^{27}\)

A View of the Present

Throughout the recent history of industrial arts two forces seem to emerge, each attempting to dominate the curriculum area. The first of these attempts to emphasize the prevocational values of industrial arts, deriving its course content from an analysis of the trades. The other force attempts to stress the place of industrial arts in the contemporary technological society and identifies

\(^{27}\)Ibid., p. 5.
it as the curriculum area which can most contribute to the understanding of today's world. The former influence, given great impetus by the American Vocational Association and the original work of its Committee on Standards of Attainment in Industrial Arts Teaching and subsequent revisions of their findings, seems to have permeated the educational institutions to a far greater degree than the latter philosophy.

There are a number of reasons for the predominance of the trade analysis philosophy over the industrial philosophy. First, there appeared in the last forty years a lack on the part of the leaders of the latter philosophy to provide the leadership necessary to implement their approach in the school systems. While the supporters of industrial arts via the trade analysis point of view have provided specific materials and syllabuses for the implementation of their program, the latter leaders have done very little besides theoretical writing; the necessary pilot and experimental programs, so essential to providing motivation and examples for teachers and teachers-to-be to emulate, have never developed. Beginning with the "reconstruction" a series of proposals regarding the latter philosophy have been made, but unfortunately none provided for the preparation of teachers to teach such a program.

As this author sees industrial arts at the present, it is a
curriculum area which can grow and truly encompass every level of education as a general education subject. This does not mean that the industrial arts which stresses prevocational objectives need be eliminated. On the contrary, this program will also increase in importance as our society becomes more technologically complex. The determination of which objectives of industrial arts are to be stressed can ultimately be determined only by the individual goals of the student.

Perhaps the individual who may be able to provide the leadership in implementing the latter industrial arts program is Delmar Olson. Like many of his predecessors, he stands in a position of leadership where he can exert much influence on the profession. If he chooses to implement his proposals described in Industrial Arts and Technology, he will undoubtedly have many followers. If he chooses to merely write more documents, as did his predecessors, his philosophy will meet the same indifference. Sheldon, Woodward, Runkle, Bonser, Bedell, and others were considered leaders in their day not because they merely wrote of their ideas; they were leaders because they implemented their ideas and people came from all over the country and from all over the world to see their ideas in action. It is unfortunate that there have been relatively few exciting implementations successfully
carried to their ends in the profession of industrial arts in the last thirty years. If one outstanding impression has been received by this author in the course of his research, it is that the profession has been recently one of prolific writers but indolent executors.
CHAPTER VIII

SUMMARY AND RECOMMENDATIONS

The history of industrial arts education is a record of youthful growth accompanied by the uncertainties and confusion experienced by all expanding disciplines. In retrospect, it is possible to examine critically the growth and sometimes stagnation of industrial arts education; it is the responsibility of every industrial arts educator and administrator to review the shortcomings as well as the contributions industrial arts has made to the education of American youth if the curriculum area is to fulfill the void existing in the technological education of students today.

The origin of industrial arts as a form of education is a controversial one. Due to the existence of a multitude of definitions and objectives related to the manual training subjects through the ages, it is difficult to establish a consensus among industrial arts educators as to the beginning of the curriculum area. Regardless of the conflict over terminology, there is evidence of manipulative work as a form of education in the history of the ancient Jewish civilization. However, following this period, during which hand-
work was considered to be a principal phase of an individual's education, handwork even of the highest quality was regarded with the lowest esteem and was termed the "banasric arts." Although skilled craftsmen were largely responsible for the comparatively high standard of living the citizens of many ancient nations enjoyed, it was not until the monastic societies of the Dark Ages that educational handwork again achieved recognition as an important form of education.

With the Renaissance came rebirth and discovery in many areas including education and science. This period of discovery and re-discovery saw greater attention given to the total education of individuals, education which definitely included the study of technological advances of the period through manipulative activities. Such philosophers and writers as More, Rabelais, and Campanella stirred the classes with challenging proposals for education. These were followed by Luther, Bacon, Petty, Dury, and others who attempted to implement some of the theories of the predecessors. Climaxing this period of growth was the work of Comenius, who is sometimes referred to as the father of industrial arts.

With the demands of the Industrial Revolution a renewed emphasis was placed on industrial education. The work of such men as Pestalozzi and von Fellenberg was highly influential in
structuring programs featuring general education handwork at that time. To further meet challenges of the period, three systems of education evolved in Europe which were to have a profound influence on education in America: the Russian system of manual training, the sloyd system, and the arts and crafts movement.

Following the Philadelphia Centennial Exposition in 1876, at which the European systems of manual education were introduced into the United States, the manual training subjects experienced a profound acceptance in many American schools. The subsequent history of industrial arts just prior to the third decade of the twentieth century is one of rapid growth, controversy, and conflict. But despite the existing controversy and conflict, the expansion of the manual training subjects was the outstanding characteristic of the curriculum area. The several decades preceding the 1920's saw pilot manual training programs of Sheldon, Runkle, Woodward, and others examined by educators from not only all parts of the United States but from all parts of the world.

If the importance of the manual training subjects during the early part of the twentieth century is doubted, one needs only to review the material devoted to the subjects in the journals and periodicals of the time to realize that the curriculum area was abundantly discussed. While certainly not all writings were favor-
able to the manual training subjects, the populace nevertheless knew that such a curriculum area existed. Too, not only were industrial arts educators concerned with the area, but other educational leaders as well.

To further realize the importance of the manual training subjects near the turn of the century, one should recall that Teachers College, Columbia University, was primarily founded to prepare manual training teachers and that a professor of manual training became the first president of Teachers College and later president of Columbia University. If the importance of a curriculum area is measured by the greatness of the men and women who vigorously discuss it, the stature of industrial arts may be measured by examining comments by such men as President Eliot of Harvard.

But the esteem and attention attributed to the manual training subjects was to be comparatively short-lived. One of the primary reasons for the subsequent decline of the manual training subjects was the inability of leaders in the field to organize and solidify thinking regarding objectives and goals of the curriculum area, thus presenting some tenable philosophy essential to new teachers and administrators involved with the curriculum area. Another reason for the decline was the organization and consolidation of the aims and objectives of vocational education and the subsequent legislation
promoted by the leaders of the movement. With the passage of the Smith-Hughes Act in 1917, attention given to the manual training subjects was probably at its lowest level since the introduction of such study in 1876.

The third decade of the twentieth century found three terms used to identify the area of industrial study whose principal objectives were of a general education nature: manual training, manual arts, and industrial arts. But however underemphasized and confused were the manual training subjects, the decade saw growth and expansion, though not real clarification, in the field.

The strongest position of the manual training subjects in the 1920's appeared to be in the elementary school. Spurred by the work of Bonser, Mossman, Russell, and others, the curriculum area saw implementation of ideas and concepts which strongly promoted the general education values of the manual training subjects. It was at this level of education that the term industrial arts was gaining more acceptance than the terms manual training and manual arts.

Another area of growth of the manual training subjects during the 1920's was in the junior high or intermediate schools. Since the primary purpose of such schools was to offer each student the opportunity to explore as many areas of study as possible, the exploratory objectives of industrial arts complemented the gen-
eral objectives of the junior high school.

Despite the notable growth of the manual training subjects during the 1920's, one outstanding weakness of the profession is now apparent. There was no real unification of industrial arts educators and little consolidation of the existing divergent philosophies and goals. Related to this weakness and perhaps the specific event which was to have a most profound influence on industrial arts in the decades to come was the formation of the American Vocational Association. The result of a merger of the National Society for Vocational Education and the Vocational Education Association of the Middle West, the move established one powerful organization for the purpose of the promotion of vocational education and related fields.

The end of the third decade found an increasing demand from educators for some standardization of industrial arts objectives, content, and methods. Called upon to investigate the existing problems and to propose feasible solutions was the American Vocational Association. The immediate consequence was the formation of the Committee on Standards of Attainment in Industrial Arts Teaching. The work of this committee continued vigorously into the fourth decade, and in 1934 the findings and recommendations of the committee, based on national responses from industrial
arts educators, were published under the title of Standards of Attainment in Industrial Arts Teaching. This publication was to be subsequently revised a number of times and became the most widely accepted single source of industrial arts standards in the United States. Promoting the study of industrial arts through an analysis of the trades, this work was to provide the basis for one of the two dominant philosophies pertaining to industrial arts education today.

In addition to the publication by the Committee on Standards, the fourth decade of the twentieth century witnessed many attempts at clarification of the curriculum area. Some of the more pertinent of these attempts were published under the titles of The Terminological Investigation and The Ohio Prospectus which supported the philosophy promoting the study of industrial arts through an examination of industry.

The fourth decade was an exciting ten-year period for industrial arts. It appeared that the curriculum area, now united in name for the most part under the title of industrial arts, was again to achieve some of the attention and importance it enjoyed at the turn of the century. Contributing to this renewed expansion were a number of periodicals devoted to the profession offering material of interest and pertinence for educators on all levels of study. Perhaps the most outstanding of these periodicals was the journal
founded by Charles A. Bennett at the beginning of the century.

Called the Industrial Education Magazine, this periodical contained
more professional material than any other journal to that time; its
articles were essential to the professional teacher who sought in-
telligent discussion of controversial and current topics related not
only to industrial arts but to education as a whole.

At the end of the decade the publication of the Industrial
Education Magazine was terminated, thus severing the means of
communication and expression for much professional writing. The
curtailment of publication of this journal was not only unfortunate,
since it came at a time when the profession urgently needed a means
of expression such as this periodical provided, but it also revealed
an outstanding weakness of the profession, specifically the inability
to provide leadership for the continuation of worthwhile undertak-
ings which give any organization the strength necessary to survive
and grow through the years. Instead of continuing the publication
started by one of the profession's productive writers, the publica-
tion was abandoned with the attitude, as expressed by one of the
prominent men in the industrial arts profession at the time, that
discontinuation of publication would allow the past issues to stand
as a monument to the outstanding contributions of Charles A. Ben-
nett. The past issues of the Industrial Education Magazine are in-
deed a fine monument to the untiring work of a great writer; it is unfortunate, however, that the monument is presently covered by years of dust in many libraries and that the industrial arts profession of the fourth decade had no person with the vision and qualities of leadership necessary to envision and nurture a living monument to Charles A. Bennett in the form of a continuing publication.

In the latter part of the fourth decade the American Industrial Arts Association was founded, an organization which has shown the potential for becoming the uniting organization necessary for the promotion of industrial arts. Since its beginning in 1939, the association has striven to increase the representation of the profession in the educational circles throughout the country. Its success in further promoting the interests and image of industrial arts may well be the key to the future of the industrial arts profession on the national scale.

The growth of industrial arts was interrupted during the first half of the fifth decade by the Second World War. Affected by the lack of the necessary tools, materials, and equipment, industrial arts assumed many interim responsibilities which caused subsequent curriculum changes. The post-war years found industrial arts in a period of re-definition and re-examination; the consequence of this reappraisal appears to be a new multitude of goals
with no clear presentation as to the aims and objectives of the cur-
riculum area.

In the years since the Second World War, with the increasing importance of technological advances evident in the society, in-
dustrial arts educators have attempted to justify the study of their subjects from many positions. If there is one common term which denotes these positions, that term is defensive; with the greater emphasis on education, industrial arts has been severely criticized in many areas for its lack of contribution to the general education of students. While purporting to reflect the technology and give each student an understanding of the industrial world in which he lives, a review of texts and periodicals still finds emphasis in in-
dustrial arts placed on the project for the project's sake.

Two philosophies are evident in the industrial arts profes-
sion today. The first of these attempts to emphasize the prevoca-
tional values of industrial arts, deriving its course content from an analysis of the trades. The other force attempts to stress the place of industrial arts in the contemporary technological society and identifies it as the curriculum area which can most contribute to the understanding of today's world. The former influence, given great impetus by the American Vocational Association and by the original work of its Committee on Standards of Attainment in Indus-
trial Arts Teaching and subsequent revisions of their findings, seems to have permeated the educational institutions to a far greater degree than the latter philosophy.

Industrial arts presently stands at the crossroad of its destiny. A continuation on the present way will find industrial arts a curriculum area devoted to the principal tasks of occupying those students who cannot be educated in the academic classroom, of being burdened with the tasks of maintaining the school along with the custodial staff, and consequently of enjoying a definite second-class recognition among educators and laymen. This is not to say that industrial arts will not make its contribution to the education of a few. However, it does mean that industrial arts will never reach the level of recognition where the general education and pre-vocational objectives of the curriculum area can be fully realized.

If the perpendicular path is chosen, industrial arts will truly expand its offerings to fulfill its heretofore generally theoretical objectives and will complete its general education mission, a mission so important to the students living in the technological society today. If industrial arts does not assume the responsibility for such education, students will not go without such education, for other curriculum areas will expand to fill the void created by the absence of a true industrial arts program.
The turn from the present course will not be a simple one to be completed in a few weeks or months. It is a turn which must start with the preparation of teachers to instruct in the new curriculum, teachers who will have the capability and vision to structure the public school courses needed to fulfill the purposes of industrial arts. It is a turn which must see the unified preparation of teaching materials, equipment, and facilities. It is a turn which requires the vision of a program which would exist one decade after the period of planning. It is a turn which will implement to a great extent the proposals by Olson in his work, Industrial Arts and Technology.

Industrial arts has been a profession of versatile writers. A review of its literature establishes the feeling that industrial arts educators can create and describe educational programs capable of achieving outstanding recognition in any school curriculum. However, industrial arts has not been a profession of implementors. It has not had the leaders necessary to take the plans from the drawing boards and to implement them in the school curriculums of this technological society.
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