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Number of Pages in Study: 68 Candidate for What Degree: Master of Science

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Scope of Study: The purpose of this study was to investigate the present status of shopwork as an area of graduate study of industrial arts education in American colleges and universities. A survey was made of seventy-one colleges and universities offerings. The courses of these institutions were analyzed and classified according to their frequency of appearance, and the amount of such credit hours that could be applied toward an advanced degree.

The writer is of the belief that such a study is beneficial to those who are seeking additional manipulative skills while pursuing a graduate degree.

Findings and Conclusions: Thirty-one of the seventy-one institutions investigated included courses of industrial arts shopwork as a graduate study area. Machine woodworking and drafting appeared more often than any other courses. Manual arts therapy, job analysis, carpentry, foundry, and lapidary and sterling techniques appeared only one time each as a separate subject.

Graduate schools established before 1930 offer less industrial arts shopwork on the graduate level than newer schools. Institutions with fewer shopwork credit hours permit a greater percentage of such hours toward an advanced degree.

The writer is of the opinion that if the present schools of industrial arts education are to cope with the growing demands of industrial arts teachers, they must include more of the latest techniques of industry and elevate more shop courses to graduate status.

ADVISOR'S APPROVAL: C. L. Hill

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By

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GRADUATE CREDIT FOR INDUSTRIAL ARTS SHOPWORK IN
COLLEGES AND UNIVERSITIES OF THE UNITED STATES

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To my wife, Anna Belle Berry, for her endurance, patience, encouragement, and efficient help during the preparation of this study, the writer is most appreciative.

W.M.B.

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CHAPTER I

THE STUDY AND SOURCE OF INFORMATION

The industrial arts program in the American secondary schools is extending industrial experiences so rapidly that the average undergraduate finds himself unprepared to teach industrial arts shopwork classes. To overcome the lack of adequate training in the undergraduate school, various teacher training institutions have instigated courses consisting of manipulative skills in the graduate schools. Because of the increasing activities of the elementary and secondary schools, the writer felt that a significant study might be made in an effort to determine how these demands are being met in the graduate schools of America. The tabulation of courses offered by the graduate schools in reference to the undergraduate curriculum and subjects taught in high schools served as factors to convince the writer of the significance of this study.

Purpose of the Study. This study is made to aid the present and future industrial arts teachers who are seeking additional manipulative skills and would like to have such courses apply to a higher degree. Through the use of this study one should be able to intelligently and quickly select a college or university that offers shopwork courses of his choice. This study further intends to ascertain the number of colleges and universities in the United States that are offering shopwork for graduate credit. This appears important in the light of the number of industrial arts shopwork teachers in the United States and the

ever increasing new industrial techniques and methods. The writer is concerned with the present and future industrial arts teachers and means whereby they may keep abreast of industrial progress.

Delimitations of the Study. The schools selected for this study are listed in the Industrial Arts Yearbook II (see Appendix B). Only the schools with industrial arts shopwork offered through the graduate school were investigated. A combination of thirty-one American colleges and universities comprise this study. The course contents will be analyzed and listed just as they appear in the college bulletins. No assumptions will be made by the writer.

Methods of Research. Two methods of research will be used to obtain information for this study. The historical data and listing of institutions conferring higher degrees in industrial arts education were obtained by extensive use of the library. Information concerning the courses offered in graduate schools will be secured from institutions and catalogs that have been presented for use in this study.

Definitions of Significant Terms. This part of the study is prepared to familiarize the reader with some terms used throughout this study. Definitions will be quoted when possible and the source stated, but in some instances it will be necessary for the writer to give his interpretation in the light of the study. Educational terms will be defined in a later chapter.

Graduate School: A graduate school is that portion of a college or university that offers educational courses beyond the Bachelor's degree to those who aspire to become intellectual leaders in various professions

and in various fields of teaching and research.

Graduate Study: Graduate study applies to the organized educational courses of those individuals who have already received the Bachelor's degree and are doing research or have done research of an educational nature in an effort to obtain a higher degree.

Master's Degree: A Master's degree is an award of educational achievement above the Bachelor's degree. This award usually requires an additional school year of research and investigation of some educational problem.

Doctorate Degree: The Doctorate degree is an award in recognition of some unusual educational achievement. This achievement is usually accomplished after two years study succeeding the Master's degree.

Semester Hour Credit: One semester hour credit requires three clock hours of laboratory work per week for an eighteen week period, or one clock hour of lecture per week for the same period.

Quarter Hour Credit: One quarter credit requires three clock hours of laboratory work per week for a twelve week period, or one clock hour of lecture per week for the same period.

Scope of the Study. This study attempts a two-fold purpose: (1) To establish what extent shopwork is offered on the graduate level in the colleges and universities of America. This purpose will be undertaken by making a study of all known institutions which offer graduate degrees in industrial arts education. Their graduate studies will be analyzed for courses consisting of laboratory exercises. (2) The second purpose will be to establish the ratings of shopwork courses. The courses will be rated according to their frequency in the schools used

in this study. A further rating will be to determine shopwork courses as applicable for graduate credit toward the Master's degree. Each school's total graduate shopwork hours will be compared with the number that may be credited for degree study.

Review of Similar Studies. A review of theses, reports, and other literature in the library of Oklahoma Agricultural and Mechanical College revealed four similar studies. Three of these studies were confined to industrial arts education on the undergraduate level. The fourth study was an investigation of theneed for shopwork on the graduate level. The important item of comparison seemed to be that three of these studies made an investigation of the curricula of teacher training institutions. The fourth study parallels this study. It made an investigation of persons engaged in training teachers of industrial arts.

McHenry's Study. In 1933, Paul T. McHenry made a study of the industrial arts programs of forty-two teachers colleges. The title of the report is A Comparative Study of Industrial Arts Education Programs for Forty-two Teachers Colleges (59). This study confined itself with the buildings, equipment, and curriculum of the twenty-one colleges and universities offering degrees in industrial arts education. The findings were, as far as shopwork is concerned, that all schools required shopwork for an undergraduate degree. The buildings, equipment, and curricula varied with the institutions. No specific attention is given to graduate schools or their curricula in any of the schools included in this study.

Ashley's Report. As a partial fulfillment for the Doctorate degree at Ohio University, Floyd Laurence Ashley made an investigation of industrial arts education in teacher education. This study was confined to the total offerings of colleges and universities awarding the bacculaureate degree in industrial arts education. It was found that programs of teacher education in industrial arts differ greatly in various colleges. These differences are seen in every factor making up the program and the range of differences is very marked in some of them. In the major element, the curriculum requirement, one notes a range of hours from 36 quarter hours in some schools to 146 which was the requirement in one school.

Tate's Study. John Bruce Tate's study, An Analysis of Industrial Arts Education Curriculum in Fifty-One Selected Colleges and Universities, investigated the offerings and requirements in industrial arts teacher education curriculums in fifty-one colleges and universities. The offerings and requirements in the industrial arts technical, industrial arts professional, and in general education courses were analyzed and compared. Considerable variation was found in the offerings and requirements of the industrial arts teacher education courses in the selected institutions.

Gimbel's Study. Armin F. Gimbel made a study of the granting of graduate credit for manipulative work. The questionnaire technique was used. The purpose of the study was to obtain various opinions as to whether shopwork should be granted graduate credit. Questionnaires were sent to high schools, supervisors, colleges, university teachers of industrial education, and department heads of teacher training institutions. Each respondent was classified as to the degree held, the position held,

and the degree sought if any. The responses were grouped and classified. The findings indicated that all favored graduate credit for manipulative work.

Organization of Remaining Chapters. Chapter II contains a brief history of the trends of industrial arts education in America. It also parallels the objectives of industrial arts with those of general education. Chapter III presents a short history of graduate study in industrial arts education in American colleges and universities, and attempts to enumerate some factors influencing graduate schools. Attention is given to the various degrees awarded for study of industrial arts. Chapter IV makes a complete investigation of shopwork courses contained in the graduate schools of thirty-one institutions. The findings of the study are summarized in Chapter V, the final chapter.

CHAPTER II

THE INDUSTRIAL ARTS MOVEMENT IN AMERICAN EDUCATION

Industrial arts as it is known in today's school has undergone several changes. The purpose of this chapter is to acquaint the reader with some of the more significant changes in the industrial arts phase of education, and to acquaint him with terms peculiar to this study.

The area of industrial arts was conceived with the trade schools of Europe, which found their way to America with the first settlers. Then came the manual training era which was the first deviation of trade training. Manual arts, a term applied to handwork in the elementary schools, appeared during the same period as manual training. Industrial arts, the present term applied to school work dealing with tools and their processes, covers both elementary and secondary schools.

Definitions of Terms. The definitions of terms given in this section will represent the writer's interpretations of these terms. These definitions have been selected in the light of currently accepted philosophies.

Manual Training:

> Manual training serves as a means to educate the individual on many sides by giving him different angles of perspectives by familiarizing him with world materials which classroom subjects alone cannot do. (7, page 12)

> The farm training and instruction, usually in wood and metal, sometimes printing and bookbinding, for boys

between the ages of twelve and eighteen, is called "manual training". (8, page 3)

Manual Arts:

The different forms of handwork given in the first six grades to boys and girls, paper-folding, picture-mounting, clay-modeling, whittling, weaving, needlework, and other constructive activities within the range of the experience of children under twelve years of age, are called "manual arts". (8, page 3)

Industrial Arts:

Industrial arts is defined 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. (19, page 3)

A study of the changes that man makes in materials to increase their values to meet needs of the appropriate usual usage of products made and/or of the social advantages and problems resulting from the making of these changes and products. (4, page 2)

Industrial Education:

A generic term including all educational activities concerned with modern industry and crafts, their raw materials, products, machines, personnel, and problems. (11, page 7)

. . . Industrial education refers to all forms of shopwork and industrial drawing taught for any purpose whatsoever. In this sense it is the all-inclusive title that should be given to a department which includes both industrial arts and trade and industrial courses. (12, page 2)

Industrial Arts Education:

"Industrial arts education", although undefined in print, as yet, refers particularly to the industrial arts program in the college or university. It suggests a professional or educational side of industrial arts as a subject and experiences that industrial arts may lack when used alone. In the preparation of teachers, "industrial arts education" is applicable because it infers professional, academic, and cultural courses or contacts, as well as the more technical aspects of training. . . (18, page 6)

> Industrial arts education refers particularly to the industrial arts program in the college or university. It suggests a professional or educational side of industrial arts as a subject and experience that industrial arts may lack when used alone. (58, page 1)

The terms manual training, manual arts, industrial arts, industrial education, and industrial arts education when used in this study may be interpreted by the above definitions.

Part A

Trends of Industrial Arts in the United States

Manipulative dexterity made its entry into the general school work during the time of Pestalozzi. Schools were established to promote the Pestalozzian concept of manual training. Phillip von Fellenberg, a devout believer of Pestalozzi, joined in the crusade to promote manual training in education. There are many more men who influenced the training of the hands in education. It is not intended that an enumeration of persons who made contribution to manual training be listed. Instead a presentation in brief of its entry into general education will be given. Fred Strickler described the entry of industrial arts into general education in America thusly:

> Industrial arts in some form or other has been a part of educational progress since the time of Frobel and other educators of the last century. There developed in this country after the Centennial Exposition of 1876, a form of industrial arts, based upon a faculty psychology of learning, that flourished for a time as "manual training". It still exists in many places. It had high ideals and was supposed to work wonderful changes in education. When outcomes failed to materialize, people were puzzled and began to question. The psychology upon which it was founded fell into disrepute. It could not be justified upon a vocational basis as was hoped. It did not develop "habits of neatness", "square dealing", "resourcefulness", "initiative", and other generalities any better than other subjects of study. . . . (16, page 93)

Trade training preceded industrial arts in American education. Organized trade training had its origin with the Mechanic Institute of New York City. The primary purpose of this training was to prepare young men for positions of mechanics. The Lyceum followed the Mechanic Institute. The Lyceum differed from the Mechanics Institute in that it offered a degree of technical information. Neither of the above movements offered shopwork in any kind of pedagogical sequence. Other movements following these are too numerous to mention in this paper.

Manual Training. Industrial arts, as it is known today, began in the schools as manual training. Calvin M. Woodard, a teacher of mathematics at Washington University, St. Louis, introduced the use of making wooden models to enable students to visualize mathematical problems. Observing that the students experienced some difficulties in manipulation of simple woodworking tools and their application, he sought to organize a study of tools. This course was to be taught with no motive to train for industrial occupations. The woodwork course proved so successful that work in several phases of metal soon followed. This early training of the use of tools and their processes was called manual training.

About the same time that Calvin M. Woodard organized manual training at Washington University in St. Louis, John Runkle, President of Massachusetts Institute of Technology, conceived the idea of teaching job analysis without teaching manufacturing processes. At the Philadelphia Exposition of 1876, Runkle observed the Russian exhibition of models and recommended to the governing body of the Massachusetts Institute of Technology that instruction shops be constructed to teach engineering students tool processes. A complete set of exercises were formed.

Other states soon accepted the manual training concept of education. In the late nineteenth century manual training was placed on the same educational plane as other courses in the high schools.

Manual Arts. The term "manual arts" was first used in 1893 at Teachers College, Columbia University, New York. Manual arts was an outgrowth of the lack of manual training to develop the art of design. Manual training also failed to provide creative expression and individual experiences for all pupils in both the elementary school and the high school. Manual arts was expected to provide those desirable educational outcomes that did not exist with manual training.

Industrial Arts. The term "industrial arts" was first used by Charles R. Richards in 1904. This term was considered best adopted because the progressive schools were varying from the original concept of manual training. Frederick Bonser encouraged the use of the term "industrial arts" in the elementary schools. Bonser's philosophy was that the term was broad enough to cover all phases of industry as a general education subject.

Since the inception of industrial arts in 1904, it has undergone many changes. There has been some mention of changing the name to "practical arts". It is the belief of this writer that Gus Nihart has been instrumental in the change of names.

The flexibility of the term "industrial arts" provided a means for education to divide and combine areas of like and unlike nature. The unit general shop, a combination of like areas of shopwork, has progressed by the broad objectives of industrial arts. The general shop has

become established by combining unlike areas of instruction into one shop. James Hicks describes the introduction of the general shop thusly:

> The first apparent organization of industrial arts instruction on a general shop basis was accomplished by Bonser and Russell in 1910 at Speyer School of Columbia University. This type of shop was referred to as a general or composite shop and the designation remains today. However, William E. Warner substituted a new term for general shop in 1930, "Laboratory of Industries". The term general shop first appeared in print as a part of the title of an article in 1923, "Household Mechanics and the General Shop", by Earl Bedell, which appeared in the Industrial Arts and Vocational Education magazine. (57, page 30)

The general shop has been organized into four distinct plans: (1) The Ettenger Plan where a student is directed through a series of shops. In each shop he spends from six to twelve weeks; (2) The Bonser Plan which provides a variety of experiences in a single shop; (3) The Gary Plan which calls for the student to obtain experience by working in productive capacities with a skilled craftsman; and (4) The Pittsburgh Plan which enables the child to spend his first year in a multiple activity shop, the second year in special shops, and then he is permitted to choose a shop of his liking.

The general shop is considered by many as the most revolutionized concept of teaching industrial subjects. Newkirk defines the general shop as:

> Shops that are planned and equipped to teach two or more distinct types of shopwork at the same time under one teacher are general shops. (13, page 15)

The general shop was conceived with the idea that it was the solution for introducing a variety of industrial experiences in the small schools. The junior high schools were specially adapted to the general shop because of their exploratory nature.

Much attention has been given the general shop because it represents the newest trend in industrial arts shopwork. Prior to the general shop, the industrial arts paralleled its predecessor, manual training.

The American education system first accepted the teaching of industrial subjects as manual training. Manual arts was later introduced in the elementary school to compensate for the lack of design found in manual training. Industrial arts, the present term applied to industrial subjects of general education, is broad in scope and suffices for both manual training and manual arts.

Part B

Industrial Arts as General Education

The preceding part of this study attempted to establish the acceptance of industrial experiences as a part of general education. This part of the study will endeavor to justify the acceptance of industrial arts as general education.

Objectives of General Education. General education usually is thought of as a group of academic subjects which have been founded upon a set of principles and fundamentals. In most instances the writer of general education has formulated objectives to best fit the needs of their work.

Cardinal Principles. The most accepted objectives of general education are set forth in the Cardinal Principles.

1. Health
2. Command of fundamental processes
3. Worthy home membership
4. Vocation

5. Civic education
6. Worthy use of leisure
7. Ethical character (9, page 256)

Bobbitt's Objectives. Bobbitt, in his book How To Make a Curriculum, lists ten objectives of general education.

1. Social intercommunication
2. Maintenance of physical efficiency
3. Efficient citizenship
4. General social contacts and relationships
5. Leisure occupations
6. General mental efficiency
7. Religious attitudes and activities
8. Parental responsibilities
9. Unspecialized practical activities
10. Occupational activities (5, page 11)

Wilber's Objectives. Gordon O. Wilber concludes that many definitions and objectives of general education may be summed up in three statements.

1. To transmit a way of life.
2. To improve and reconstruct that way of life.
3. To meet the needs of the individuals. (19, page 3)

General education as presented by these three authorities concerns itself with the whole development of an individual. The goal is to develop people to adapt themselves to everyday problems of life.

Objectives of Industrial Arts. The objectives of industrial arts are completely absorbed in the objectives of general education as set forth by the Cardinal Principles, Bobbitt, and Wilber. The industrial arts program serves as a tool for the promotion of the objectives of general education.

Objectives in Oklahoma. The Committee for the handbook Industrial Arts in Oklahoma formulated seventeen objectives of industrial arts.

1. Industrial arts is complementary to other school subjects and provides opportunity to apply knowledge learned in other school subjects.

2. Develops an appreciation of applied knowledge and skills.

3. Provides a knowledge of industrial drawing, the language of industry, and methods of expressing ideas by means of drawing.

4. Contributes to later vocational efficiency.

5. Stimulates students' knowledge and appreciation of good design.

6. Instills a satisfaction in personal achievement.

7. Develops the ability to analyze a job into its processes and organize them into correct procedure.

8. Contributes to consumers knowledge and induces an appreciation of the value of industrial materials and the need for their conservation.

9. Trains in industrial and home safety (including fire prevention).

10. Acquaints students with industrial information and induces a recognition of the standards of industrial attainment.

11. Develops avocational interests.

12. Trains individuals to be more resourceful in dealing with the materials problems of life.

13. Stimulates correct attitudes toward an orderly shop, home, and environment.

14. Aids in making vocational choices.

15. Develops qualities of leadership.

16. Develops cooperative attitudes in work habits.

17. Develops an appreciation of the dignity and importance of the occupations of one's neighbors. (12, page 3)

The American Vocational Association's Objectives. The American Vocational Association, in attempting to clarify industrial arts in the light of general education, offers the following objectives.

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

2. Develop in each pupil the appreciation of good design and workmanship and the ability to select, care for, and use industrial products wisely.

3. To develop in each pupil the habits of self-reliance and resourcefulness in meeting practical situations.

4. To develop in each pupil a readiness to assist others and to join happily in group undertakings.

5. To develop in each pupil desirable attitudes and practices with respect to health and safety.

6. To develop in each pupil a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests.

7. To develop in each pupil that habit of an orderly, complete efficient performance of any task.

8. To develop in each pupil an understanding of drawing and the ability to express ideas by means of drawing.

9. To develop in each pupil a measure of skill in the uses of common tools and machines and an understanding of the problems involved in common types of construction and repair. (1, page 18)

Wilber's Objectives. Gordon O. Wilber associates industrial arts with general education by enumerating the desirable outcomes of industrial arts in the form of objectives, thusly:

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes, 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 knowledge to a point where students can select, buy, use and maintain the products of industry intelligently.

5. To provide information about and 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 followship, and tact.

8. To develop a certain amount of skill in a number of basic industrial processes. (19, page 42)

The Cardinal Principles and Industrial Arts. The industrial arts program, when paralleled to the Cardinal Principles, denotes that it is in complete support of the objectives of general education, as may be seen below.

1. Health. Industrial arts promotes better health by encouraging safety in the operations of tools and machines.

2. Command of fundamental processes. Industrial arts commands the use of other school subjects. Arithmetic problems must be solved. Reading is exhibited in translating drawings to projects and in other informational materials. Writing is demonstrated in drawing courses.

3. Worthy home membership. This objective is achieved through the child consciousness of his household fixtures. The child learns to purchase wisely. A handyman aspect is achieved thus enabling the child to make minor repairs around the home.

4. Vocations. The industrial arts program is exploratory in helping a child to determine his life's work.

5. Civic education. Civic education is expressed through field trips and visits to the school by industrial personnel. This objective

is further achieved by making studies of how industrial processes affect everyday life.

6. Worthy use of leisure time. Industrial arts may be avocational in nature, thus developing useful hobbies.

7. Ethical character. Honesty is essential in an industrial arts program. Morals are expressed in cooperative assignments.

The industrial arts program is definitely an integral part of the general education program. It is quite unlike its precedents "manual training" and "manual arts". Industrial arts has taken the firmer hold because of its broad objectives and its support of general education. The succeeding chapter presents a brief historical sketch of industrial arts as a general education subject in American graduate schools.

CHAPTER III

INDUSTRIAL ARTS EDUCATION ON THE GRADUATE LEVEL IN THE UNITED STATES

Early graduate training in industrial arts education in the United States had its origin the same as general education. For the most part there were no organized curriculum in its first stages of development. Students, upon successfully completing the requirements for the undergraduate degree, were admitted for additional work to qualify for an advanced degree. In most instances, these degrees were conferred upon those who passed a rigid set of examinations and presented a thesis to a council. The council usually consisted of the head of the department in which the research work was done, the president of the college, and the faculty of the department in which the work was sought.

Part A

The Master's Degree Before 1900

In its early conception, manual training, which later became industrial arts, was primarily for the training of youth for some type of work requiring manual dexterity as a life's vocation. Considering these facts, the heads of institutions were quite hesitant to place such courses on the same plane as that of academic subjects. In most instances where institutions awarded the graduate degree, no mention was made of industrial arts classes as being offered for advance study.

Rensselaer School. The Rensselaer School, long regarded as the first graduate school in America, had no specific training for manual arts students. However, it suggested that manual training be used as scholastic exercises for students of science. Of the Rensselaer School, Charles Thwing makes this observation:

> The first school of science and the first school of civil engineering established in any English speaking country was established in Troy, N. Y., in 1824. It was called the Resselaer Polytechnic Institute. Its founder was Stephen Van Rensselaer, and in association with him in its early history was Amos Eaton. Rensselaer desired to establish a school to teach those who may wish to apply "science to the common purposes of life". (17, page 421)

The Rensselaer School, because of its fine faculty and unique methods of associating applied science to everyday life, attracted many college graduates who wished to do advance work. "Because of this fact and the stimulus it gave research in those early days, Rensselaer has been regarded as the first graduate school in America." (2, page 352)

The Oklahoma Agricultural and Mechanical College. Like most agricultural and mechanical colleges, the Oklahoma Agricultural and Mechanical College was founded as a result of the Morrill Act of 1862. The Morrill Act, in part, granted each state 30,000 acres of land to provide colleges of agricultural and mechanical arts. The institution, founded in 1890 to promote practical education to the industrial classes, offered its first advanced degree twenty years later. According to the Twenty-First Annual Catalog, the program was very weak, without specific reference as to what particular departments were offering the master's degree.

> The degree Master of Science will be granted upon the completion of twenty-eight hours' work carried for one year or fourteen hours' work carried for two years and the presentation of a satisfactory thesis. Graduate students can

> be registered only upon approval of the heads of the departments concerned, the faculty, and the president of the college. Those who desire to register as graduate students are advised to communicate with the president or with the head of the department in which they desire to work. (15, page 14)

At this time there was no distinct industrial arts, manual training, or manual arts department at the Oklahoma Agricultural and Mechanical College, but most of the shopwork was listed under Mechanical Engineering. Therefore, it is the belief of the writer that shop teachers were prepared in this division of engineering.

During the school year 1917-18, DeWitt Hunt, a young man from Valparaiso University, was made superintendent of shops. This is the first instance of a definite curriculum for the training of manual training teachers at this institution.

The University of Georgia. The University of Georgia, established in 1785, made plans to confer the master degree upon students holding the Bachelor of Arts degree and a record of good character. This practice continued for nearly one hundred years before a course of study was prescribed. Quoting from the Graduate Bulletin of the University of Georgia:

> Although the first statutes of the University contemplated resident graduate students, it was the custom here (as it was in many other colleges and universities) to confer the degree of Master of Arts upon any Bachelor of Arts of good character who, three years or more after graduation, made application for the degree and paid a required fee. This practice continued until 1868, at which time a course of study was laid down which candidates for the master's degree were expected to pursue. From 1869 until 1890 the regulations required the candidates to complete successfully the most advanced course in each of the academic (non-professional) schools. In 1892 the requirements for the degree became substantially the same as they are now, though slight modifications have been made from time to time. . . .

> . . . . Prior to 1910 the graduate work of the University was supervised by the faculty, chiefly through its Committee on Graduate Courses. In 1910 the Board of Trustees set the work apart by the creation of the Graduate School and the appointment of its first dean. In 1940 a Graduate Faculty was established with authority to determine the policies and the standards that are to be applied to graduate work in the University. (52, page 7)

Though no mention is made of advanced studies for the masters degree, it is suggested that during the three-year period the student would make some worthy contribution in the field wherein the degree was sought.

Kansas State Teachers College, Manhattan. The Kansas State Teachers College, Manhattan, resulted in direct response to the Morrill Act. Ninety days after the passing of the Morrill Act the Legislature of Kansas set aside 90,000 acres of land for the Kansas Agricultural College near Manhattan, Kansas, where years before the Morrill Act the citizens had established an institution, the Bluemont Central College. This institution had the same aims as those of the Morrill Act. The Bluemont Central College was given to the state and on September 2, 1863, Kansas State College began operation at that location. Soon after its establishment, it began to offer honorary masters degrees in recognition of outstanding educational achievements. This practice continued until 1886 when at this time it became necessary for a student to study in a specific field. The College Catalog states:

> In 1886 the College abandoned an earlier practice of conferring the master's degree for honorary purposes, or for recognition of educational growth of the graduate or for special service to the community. In that year a standing committee on graduate work was created. Thereafter, it was established that only a master of science degree would be granted by the college and that a candidate must demonstrate proficiency in one of the industrial arts or sciences. Industrial Arts included agriculture, horticulture, engineering, architecture and designing, and

> domestic economy. . . .
>
> . . . . Finally, in November, 1931, a separate division of graduate study was established under a dean; and with these changes the administration of the graduate work in the college assumed its present form. In 1942 the Division of Graduate Study was renamed the Graduate School. (34, page 11)

From the above, it is clear that the institution sought to clarify the range of industrial arts. It was done by enumerating the several studies to be classed as such. Specific courses of higher quality requiring a degree of research were instituted to raise the professional significance of the master's degree.

Ohio State University. The Ohio State University, a combined university and agricultural and mechanical college, began graduate work in 1878 and each department supervised its own graduate work separate from the other departments of the institution. In 1911 the Graduate School was organized to supervise all the graduate work throughout all divisions of the institution.

The Agricultural and Mechanical College of Texas. The passing of the Morrill Act of 1862 influenced the Texas legislature to establish the Agricultural and Mechanical College of Texas in 1871. The Graduate School was not established until 1924. During the time between 1871 and 1924 graduate work was under the direction of the general faculty acting through a committee on graduate studies.

Louisiana State University. Louisiana State University awarded its first master's degree in 1869. The courses of study were vague, being administered solely by the heads of the departments. Walter L. Fleming

describes the early graduate training thusly:

> The courses of study were rearranged in 1881 and the new courses put into operation in 1882. . . . and agricultural and mechanical courses were formed, each two years in length, leading respectively to the degree of Graduate in Agriculture (G.A.) and Graduate in Mechanics (G.M.). A two-year preparatory course was given. After completing the work required for one of the bachelor's degrees, a student might take an additional year's work for the degree of Master of Arts. (10, page 396)

The new schedule showed no offerings that could be construed as a shopwork class in the "Mechanics" listings.

The greatest influence of graduate training in America during the nineteenth century may justifiably be the Morrill Act of 1862. This act in part provided means whereby the states could finance schools for the promotion of higher training in the mechanic arts. Most states readily took advantage of the act and established agricultural and mechanical colleges or combined agricultural and mechanical training to the then existing state training institutions.

Part B

Growth of Graduate Schools in Industrial Arts Education

Nearing the end of the nineteenth century, industrial arts education (or manual training as it was then called) found a firm place in the education of the American youth. Dr. John D. Runkle, president of the Massachusetts Institute of Technology, upon visiting the Philadelphia Exposition of 1786, discovered means of teaching the manipulation of mechanical arts. At the same time, Dr. Calvin M. Woodard had found a need for teaching some shopwork at Washington University, St. Louis. The then established institutions, which were offering work in industrial

arts education, began to revise their courses to conform with the new methods of training and the demand for trained teachers of industrial arts increased.

Although there was a definite change in the type of instruction offered to students seeking graduate training, the number of institutions offering master's degrees remained very small. As late as 1938 Chris H. Gronemon observed, "There are forty schools at the present time which offer a master's degree in industrial education". (21, page 238) This represented a very low per cent of the total schools offering the master's degree. The number of schools offering the master's degree in industrial education or industrial arts has increased immensely since 1938. The Industrial Arts Yearbook, Number Two, lists seventy-two colleges and universities offering graduate work in industrial arts or industrial education.

Despite the impetus that the Morrill Act of 1862 gave industrial arts education, the rise of advance study was very slow. This Act was concerned primarily with colleges, so there was no need for the high school teacher to seek advanced study. A very small per cent of the colleges carried their programs beyond a two-year course. Four acts of Federal Aid definitely influenced the growth of graduate training in industrial education.

Smith-Hughes Act. The Smith-Hughes Act of 1917 provided funds for the teaching of trade and industrial education at the secondary school level. Within itself this act gave a promising salary to teachers of industrial subjects. As a result of this economic advancement, employment competition developed. Teachers sought higher educational

accomplishments to meet specific qualifications for employment.

The Civilian Conservation Corps and National Youth Administration. The Civilian Conservation Corps (C.C.C.) and the National Youth Administration (N.Y.A.) greatly influenced industrial education. The C.C.C., established in 1933, gave vocational training to unemployed youths. The N.Y.A., established in 1935, provided work for unemployed youth while attending college. There was a specific clause in the N.Y.A. naming the type of training of the recipient.

The Serviceman's Readjustment Act of 1944. The Serviceman's Readjustment Act of 1944 undeniably gave rise to the establishment of graduate schools. Between the years of 1935 and 1944 sixteen schools included in this study initiated graduate training in industrial arts or industrial education. The next ten years, ten schools entered work leading toward the master's degree in their programs. It has been acclaimed that the returning veteran sought to benefit from the new certifications and salary increases instituted by many states between the years 1935 and 1954.

The growth of graduate training in industrial arts has been seen as a slow process as compared to that of the liberal arts. The steady increase in professional training may be accredited to the different types of federal aid, whether direct or indirect.

Part C

Graduate Degrees

Despite the acceptance of industrial arts as a part of general education, it is failing to establish a school of its own in the graduate

schools of the many colleges and universities in the United States. From the institutions studied in this report, it was found that the industrial arts division is located in at least ten different divisions and only two institutions had an established industrial arts department or a school of industrial arts. The graduate degrees of industrial arts majors vary just as the schools in whose departments they are found. In instances where the industrial arts department is a part of the school of education, the degree awarded is usually a Master of Science or Master of Education. The Master of Arts usually being conferred when the industrial arts department is found in the school of physical science or art. The larger institutions that are able to provide a varied program in industrial offer either the Master of Science or the Master of Arts. For the most part, the teacher training institutions confer the Master of Science degree. An analysis of the type of degrees awarded by the institutions used in this study and the per cent of the institutions awarding such degrees may be seen in Table I.

TABLE I

DEGREES AWARDED

Degree	Number of Schools	Per cent
Master of Science	16	51.6
Master of Arts	16	51.6
Master of Education	5	16.1
Master of Science in Education	1	3.2
Master of Science in Industrial Arts	2	6.4

Doctorate Degree. This study revealed no instance of institutions that conferred the Doctorate Degree in which opportunity was afforded to do work in the industrial arts laboratory that would be applicable to

the degree. The work beyond that of a master's degree converted to the school of education and the advanced degree pursued would either be the Doctor of Philosophy (Ph.D.) or the Doctor of Education (Ed.D). According to the May 1955 issue of the Industrial Education magazine, there were fewer than ten institutions in the United States offering the doctorate degree in industrial education. This could account for the fact that shopwork has not been advanced to the doctorate level. An editorial of this issue comments:

> It is said that at the outbreak of World War II, there were only three or four men in the United States holding the Doctorate degree whose graduate majors had been in vocational education, using that term in its broad and inclusive interpretation. Since that date and more especially in the past ten years, a considerable number of men in the fields of industrial arts, guidance and vocational education have earned this degree. In 1930 a Committee of the Manual Arts Conference of the Mississippi Valley reported fewer than ten institutions in the United States offering work leading to the Doctorate degree, and providing adequate facilities for graduate major study in these fields. The committee expressed the opinion, further, that there is no need for increasing the number of institutions at least for the present. The increase in number of men holding Doctorate degrees is a notable tribute to the secure professional standing of these subjects in public education, and to the belief in their future as well as assurance of the high types of educational leadership now available. (22, page 146)

A more recent report from the Industrial Education magazine, May 1937, in a summary of higher degrees held up to 1937, makes the following statement:

> Teachers, in schools of less than college grade, holding the Master's Degree, 190.
>
> Supervisors, directors and members of faculties of teacher-training institutions, holding Master's degrees, 75.
>
> Holders of the Doctorate degree, 10.

> Total to date master degrees, 712; doctorate degrees total 83 of 795 higher degrees in Industrial Arts and or Industrial Arts Education. (24, page 154)

During the two-year period 1935 to 1937 there were six or seven more doctorate degrees awarded to those who had received their master's degrees in some phase of industrial education. This increase brought the total to ten, thus denoting a definite trend in higher education for industrial majors.

Master's Degree. Since the master's degree is usually a prerequisite of the doctorate degree, it has made rapid strides in industrial education. In 1927 Fred Strickler made a survey of the training and experience of 480 industrial arts teachers.

> Sixty-two one hundredth of one per cent of the 480 teachers have the Ph.D. degree, 3.33 per cent of these have the master's degree, 29.38 per cent have the bachelor's degree, 31.25 per cent have diplomas from institutions of higher learning, and 35.42 per cent have had one year or less of college work. (16, page 70)

This survey as made by Strickler in 1927 differs greatly from the one made seven years later by the Industrial Education magazine.

> Within the past ten years another forward movement has been getting underway with the discovery that high school teachers with master degrees are becoming available. The number of high schools is increasing rapidly that does not even consider the applicant of teachers who do not hold the advanced degree, supplemented by a record of successful teaching experience.
>
> The publication in the May number of this magazine of a list of more than sixty shop teachers who hold the master's degree . . . As a result of the many replies to the requests which were published at that time, the editors are able to present another list of more than eighty such teachers.
>
> It should be observed that these lists are intended to include only teachers of shopwork and drafting in junior and senior high schools and vocational schools.

> The first purposely excluded supervisors and directors, also members of college and university faculties. (23, page 259)

The rise in the number of holders of the master's degrees in industrial education is representative of the acceptance of industrial arts as a part of general education.

Graduate study in the colleges and universities of the United States is now in what may be called its second stage. The first stage was the unorganized curriculum and the present stage the organized curriculum. In the unorganized curriculum, there were not set standards of achievement required to merit the graduate degree. This practice covered a period from the origin of higher degrees until shortly before 1900. The organized curriculum era introduced the graduate school which in turn co-ordinated the studies and gave professional meaning to the degree.

The steady growth of institutions awarding the higher degrees and the desire of individuals to obtain such degrees may be attributed to federal aid in industrial education. With the introduction of each new act by Federal Legislation, there comes a numerical increase in institutions and a likewise increase in the recipients of the degrees. The greatest increase of note stemmed from the Veteran Rehabilitation Act of 1944. The writer is of the belief that many of the institutions and courses discussed in the following chapter were inspired by federal aid.

CHAPTER IV

CATALOG STUDY OF SHOP COURSES

The previous section of this study gave a brief historical sketch of the development of the graduate school and influences which affected its growth. This chapter is devoted to the manual manipulative courses that are offered by the various colleges and universities used in this study. An attempt is made to classify these courses as to their content and rate them as to their frequency of appearances among the institutions.

Of the seventy-one institutions which responded to this study, thirty-one were found to offer courses on the graduate level. These courses consisted wholly or in part of manipulative skills that could be applied as part of the plan of study for the graduate degree. In many instances some of the thirty-one institutions which offered shopwork were vague in specifying the exact content of the course or the exact value (semester hours) of the course. The rank of the course, as to graduate, senior, undergraduate and graduate, teacher trainer, or special, is sometimes questionable. Most institutions gave graduate credit to senior undergraduate courses and some gave graduate credit for junior undergraduate courses with emphasis being placed on additional work required for graduate credit. To ascertain what courses carried graduate credit, the writer referred to that portion of the college catalog which designated graduate courses or courses which could be used for graduate credit by course number.

Part A

Thirty-one Institutions and Shopwork Courses

The offerings of the thirty-one colleges and universities are listed here in the exact titles as they appear in their bulletins. Quarter hours have been changed to semester hours. The numerical number following each course represents the semester hour credit. The asterisk preceding a course is an indication that the course is not primarily designed for teacher training but may be applied to a graduate degree. The institutions and courses are as follow:

	Hours
1. A. and T. College, Greensboro, North Carolina	
Plastics	2
Handcrafts	2
Advanced Furniture Design and Construction	2
Electricity for Industrial Arts Teachers	2
Problems in Industrial Arts	4
Comprehensive General Shop	2
Construction and Use of Instructive Aids	2
2. Arizona State College, Flagstaff, Arizona	
Industrial Arts for the Elementary School	2
3. Arizona State College, Tempe, Arizona	
Aeronautical Instructional Materials	2
Pre-Flight Aeronautics for Teachers and Laymen	3
Celestial Navigation for Ground School Instructors and Teachers	3
*Steel Square and Roof Framing	3
*Geometry of the Steel Square	3
*Estimating and Contracting	3
*Industrial Production of Upholstered Projects	3
*Furniture Construction	3
General Shop	3
Beaux Arts Atelier	2
Beaux Arts Atelier	4
*Practical Application of Building Materials	3
Period Furniture	3
*Building Design	3
*Advanced Building Design	3
*Advanced Use of Building Materials	3

	Hours
*Micro-Wave Techniques	3
*Radio-Frequency Test and Measurements	3
*Advanced Principles of Television	3
*Broadcast Radio	3
*Advanced Broadcast Techniques	3
*Sheet Metal	3
Shop Maintenance	3
*Auto Mechanics	3
*Auto Ignition and Repairs	3
General Metals	3
Machine Shop	3
Machine Shop	3
*Auto Body and Fender Repair	3
Advanced Welding	3
Design and Construction of Corrective Equipment	3
Curriculum Making	2
Seminar in Industrial Arts Education	3

4. Bradley University, Peoria, Illinois

Industrial Arts	2
Mechanical Drawing	2
Electricity	2
Metalwork	2
Woodwork	2
Technical Problems	6
The Teaching of Automotive Engine Testing Rectifiers and Converters	3
Electrical Projects	3
Leatherwork	3
Plastics	3
Craftmetal and Jewelry	3
Printing	3
Equipment Maintenance and Shop Organization	3
Advance Metalwork Problems	6
Manufacturing Practice	5
Machine Cabinet Work	3
Equipment Maintenance	3

5. Colorado Agricultural and Mechanical College, Fort Collins, Colorado

Work in Arts and Crafts	2
Methods in Arts Design	2
Advance Methods in Bench Woodwork	2
Advance Methods in Machine Woodworking	2
Advance Methods in Cabinet Making and Wood Finishing	2
Advance Methods in General Metals	2
Advance Methods in Art Metal Work	2

	Hours
6. Eastern Kentucky State College, Richmond, Kentucky	
Crafts for Elementary Teachers	3
Weaving and Upholstery	2
Crafts (Plastics)	3
Crafts (Carving, Jewelry Making, Wood Inlay and Leatherwork)	3
Advance Cabinet Construction	6
Wood Turning	3
Carpentry	6
Fundamentals of Applied Electricity	3
*Electrical Power and Motor Repair	3
Machine Shop Practice	9
Art Metal Work	3
Sheet Metal Work	3
Blueprint Reading	3
Machine Woodworking	3
Problems and Practices of the General Shop	3
Characteristics and Maintenance of Machine Tools	2
7. East Texas State Teachers College, Commerce, Texas	
Machine Woodwork	4
Advance Cabinet Design and Construction	4
Machine Drawing	8
Advance Metal	6
*Advance Printing	6
Elementary Linotype Operation	3
Advance Linotype Operation	3
Elementary Press Work	3
Advance Press Work	3
*Advance Offset Plate Making	3
Architectural Drafting	4
Handcrafts	4
Applied Electricity	4
Elementary Industrial Arts Laboratory	4
Elementary Industrial Arts	4
Principles of Typography	3
8. George Peabody College for Teachers, Nashville, Tennessee	
Advance Weaving	2.5
Advance Pottery	2.5
Advance Crafts	2.5
Graphic Arts Laboratory	2.5
Arts and Crafts for Teachers	2.5
Advance Drafting	2.5
Advance Drafting Construction	2.5

	Hours
9. Indiana State Teachers College, Terre Haute, Indiana	
Special Problems in Drafting	2.5
Special Problems in Wood	2.5
Special Problems in Metal	2.5
Special Problems in Graphic Arts	2.5
Special Problems in Electricity	2.5
10. Illinois State Normal University, Normal, Illinois	
Special Projects in Industrial Arts	3
11. Kansas State College, Manhattan, Kansas	
Woodwork	
Machine Tool Work	
Metallurgy	
Welding	
Foundry	
Sheet Metal	
Heat Treating	
12. Kent State University, Kent, Ohio	
Industrial Arts for the Elementary School	2
Teaching the General Shop	2
Ceramic Technology	2
Ceramic Production Processes	2
Architectural Drawing	2
Engineering Drawing	2
Industrial Arts Design	2
Industrial Arts Drawing	2
Electricity Technology	2
Industrial Electricity	2
Art Metalwork	2
General Metalwork	2
Metal Fabrication	2
Metallurgy	2
Plastics Technology	1.3
Leather Technology	1.3
Automotive	2
Driver Education	2
Aviation	2
Cabinet and Furniture Construction	2
Finishing of Industrial Projects	2
General Woodwork	2
Machine Woodworking	2
Upholstery	2
Graphic Arts, Teaching Aids, Public Relations	2

	Hours
13. Miami University, Oxford, Ohio	
*Industrial Ceramics	3
Metalcraft	3
Advance Industrial Drawing	3
Architectural Details	3
Automotive Theory and Practice	3
Books: Their Materials and Construction	3
Photography and Silk Screen Printing	3
14. Middle Tennessee State College, Murfreesboro, Tennessee	
Organizing and Teaching the General Shop	2
Problems in Industrial Arts Education	6
Cabinet Making	2
Advance Cabinet Making	2
General Production	2
Machine Shop, Gear Cutting	2
Machine Shop, Advance Machining	2
Machine Shop Design and Production	2
Advance Welding	2
Sheet Metal	2
Aircraft Sheet Metal	2
Advance Crafts	2
Advance Ceramics	2
Advance Plastics	2
Radio I	2
Radio II	2
Electric Machinery	2
Electronics	2
House Wiring	2
Architectural Drawing	6
Furniture Designs	2
Topographic Drawing	2
Sheet Metal Design and Pattern Development	2
15. San Jose State College, San Jose, California	
Shop Machines and Tool Maintenance	2
Seminar Drawing	2
Special Problems in Drafting	2
Furniture Design	1.2
Special Problems in Woodwork	3.3
The Teaching of Metalwork	3.3
Special Problems in Metal Work	3.3
Quantity Production in School Shops	2
Electricity in Education	3.3
Special Problems in the Electrical Area	3.3
Advance Automotive Mechanics	3.3
Special Problems in Automotive Mechanics	3.3

	Hours
Special Problems in Graphic Arts	3.3
Special Studies in Industrial Arts	4

16. State College of Washington, Pullman, Washington

Crafts Workshop	4

17. State University of New York Teachers College, Oswego, New York

Development of Industrial Arts Projects and Instructional Aids	
Practice in Advance Woodworking	
Practice in Advance General Metalwork	
Practice in Ceramic Design and Construction	
Practical Electronics	

18. Tennessee A. and I. State University, Nashville, Tennessee

Advanced Drafting Projects	2
Advanced Metal Working Projects	2
Industrial Handicrafts	2
Advanced Applied Electricity	2
Furniture and Cabinet Construction	2
Aircraft Power Plant	2

19. Texas College of Arts and Industries, Kingsville, Texas

Woods, Advanced	3
Metal Art	3
Ceramics, Advanced	3
Machine Shop	3
Photography	3
Plastics	3
Lapidary and Sterling Techniques	3
Leather, Advanced	3
Plastics, Advanced	3
Advanced Problems in Ceramics	3
Advanced Problems in Photography	3
Advanced Arts and Crafts	3
Advanced Research in Industrial Arts	3

20. The Agricultural and Mechanical College of Texas, College Station, Texas

Visual Aids for Industrial Subjects	2
Auto Mechanics	2
Electricity	2
Cabinet Making	2
Machine Shop	2
Ornamental Metal Work	2

		Hours
21.	The Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma	
	Industrial Arts Design	2
	Special Problems in Machine Woodworking	3
	Problems of the General Shop	2
	Special Problems in General Shop	3
	Minor Problems in Industrial Arts Education	4
	Oxy-acetylene and Electric Welding	2
	Wood and Metal Finishing	2
	Advanced Welding	1
	Plastic Working	2
	Special Problems in Machine Shop Practice	3
	Special Problems in Industrial Drawing	3
22.	The Stout Institute, Menomonie, Wisconsin	
	Applied Electronics	2
	Tool and Die Making	2
	Problems in Graphic Arts	2
23.	The University of Florida, Gainesville, Florida	
	Advanced Industrial Design	3
	Individual Work	3
	Industrial Arts and Vocational Laboratory Seminar	3
	Handcraft Seminar	3
	Industrial Arts and Vocational Laboratory Seminar	3
24.	The University of Georgia, Athens, Georgia	
	Industrial Arts Seminar	3
25.	Wayne University, Detroit, Michigan	
	Airplane Engine Shop	2
	Airplane Construction and Repair	2
	Aircraft Welding	2
	Plastic Craft	2
	Advanced Techniques in General Metal Working	2
	Modern Industrial Processes	6
	Teacher's Aids and Devices	2
26.	Western Michigan College, Kalamazoo, Michigan	
	Research in Machine Shop Practice	2
	Instructional Aids	2
	Problems in Metalworking	2
	Problems in Woodworking	4
	Furniture Construction	3

	Hours
Problems in Electricity	4
Arts and Crafts Technique	4
Advance Problems in Graphic Arts	4
Advance Drafting Practices	4
Automotive Transportation Workshop	2
Automotive Diagnosis and Corrections Workshop	1
Arts and Crafts for Teachers	2
Welding for Teachers	2

27. Western Washington College, Bellingham, Washington

Industrial Ceramics	2
Surfaces Finishes	2
Practical Lettering Technique	2
Industrial Units in Drafting	2
Instructional Units in Metals	2
Instructional Units in Woods	2
Instructional Units in Graphic Arts	2
Instructional Units in Industrial Arts for Elementary Schools	2
Advanced Photography	2
Instructional Units in Photography	2
Advanced Applied Electricity	2
Power and Transportation	2
Construction and Use of Visual Aids	2
Problems in Industrial Arts	2

28. North Carolina State College, Raleigh, North Carolina

Laboratory Problems in Industrial Arts	6
Special Problems in Industrial Arts	2

29. North Texas State College, Denton, Texas

Design in Industrial Arts	3
Advanced General Welding	3
Upholstering and Wood Finishing	3
Advanced General Machine Shop	3
The Development of Shop Projects and Industrial Aids	3
Design and Construction of Shop Tools and Equipment	3
Industrial Plant Experience	6

30. Ohio University, Athens, Ohio

Advanced Work in Wood, Metal, Printing, or Power	6

31. Sam Houston State Teachers College, Huntsville, Texas

Advanced Furniture Making	3
Shop Work for Junior High School	3

The number of shopwork courses varied throughout the thirty-one institutions. No specific criterion could be established as to the basis of determining why certain courses were given graduate credit while similar ones were not. In most instances the bulletins stated that courses not listed may be included in the plan of graduate study upon the consent of the advisor and the graduate council.

Part B

Frequency of Courses

A study of the shopwork classes reveals: (1) a number of institutions offer the same course more than once. No reason was made known for such occurrences in the catalogs. The writer found through results of this survey that the courses involved appeared under different course numbers with one course being designated as an advance course; (2) some shopwork class titles are so worded that it is difficult to perceive that shopwork actually exists; (3) class titles do not necessarily denote their content. For practical purposes, the writer combined all courses of similar content in determining the frequency of their appearance in the bulletins used in this study. The courses as grouped appear as follow:

Plastics: Plastics specifically deals with plastic material and is free of any combination. This course was offered in seven institutions or 22.5 per cent of the total institutions.

Handcrafts: Handcrafts include all courses in the craft area where hobbies are emphasized. The work of the student is primarily concerned with hand tools. Twelve institutions offered courses of handcraft to represent 38.7 per cent of the thirty-one colleges and universities.

Machine Woodworking: This course embodies all subject titles where woodworking machines are used extensively. Some listings are found

under furniture and cabinet making. One of the most offered courses, Machine Woodworking was listed by sixteen institutions as a course for graduate credit. This represented 51.6 per cent of the study.

Applied Electricity: Applied Electricity, as used in this study, consists of courses of industrial arts electricity such as electrical projects, home mechanics electricity, etc. Applied Electricity was offered by eleven institutions or 35.4 per cent of the thirty-one schools.

Graphic Arts: Graphic Arts includes the areas of silk screening, bookbinding, and printing. Such subjects as these are now being given graduate credit in eleven institutions which total 35.4 per cent.

General Shop: All courses under the headings of general shop, laboratory of industries, composite shop, etc., are classed as General Shop. This area was found in five institutions on the graduate shopwork basis to establish 16.1 per cent of the schools.

Construction of Teaching Aids: This title covers all subject titles that direct manipulative activities toward the making of aids to be used in the classroom. Teaching Aids were offered by seven institutions and represent 22.5 per cent of the respondents to this study.

Aeronautics: Aeronautics includes ground training, flight, pre-flight, and aviation mechanic courses. Four graduate programs, or 12.9 per cent, contain this course.

Construction Building: Subjects of masonry, industrial carpentry, or any of the building trades are classed as Construction Building. This course was offered in two college graduate curriculums for 6.4 per cent of total schools.

Drafting: Drafting constitutes all courses of drawing of a mechanical nature. Some of these courses may be titled in the bulletins as Design, Drafting, Mechanical Drawing, etc. These courses were listed by sixteen institutions in their combined state to make 51.6 per cent of the colleges studied offering drafting.

Radio and Television: Radio and Television entail areas of broadcast plus those of repair and maintenance of radio and television. Only three graduate schools are among those listing courses pertaining to radio and television. These courses rated 9.3 per cent of the schools studied.

Automotive: This title represents courses entitled Transportation, Automotive Mechanics, Body and Fender Work, and Auto Ignition. Of the thirty-one respondents, eight, or 9.3 per cent, offered automotive courses on the graduate level.

Sheet Metal: This title embraces all courses of sheet metal to include airplane sheet metal. This course was offered in six institutions' graduate programs for 19.3 per cent of the total schools.

Shop Maintenance: Found under many titles, this course embodies all subjects dealing with the care of tools and machines. Shop maintenance courses totaled 19.3 per cent of the schools studied and six institutions offered such courses.

Machine Shop: Machine Shop consists of all courses using metal cutting machines. Twelve colleges representing 38.7 per cent of the study included machine shop for graduate credit.

General Metals: Subjects where two or more areas of metalwork are taught in the same shop at the same time are classed as General Metals. This course appeared in seven different graduate programs for 22.5 per cent of the responding schools.

Welding: Welding represents all courses consisting of all types of welding. As a graduate course, welding appeared seven times for 22.5 per cent of all respondents.

Manual Arts Therapy: Especially designed classes for training teachers to work with physically handicapped are called Manual Arts Therapy. As a graduate course, only one institution (3.2 per cent) included training to teach handicapped people.

Individual Problems: This includes those areas where students are permitted to choose special problems peculiar to their interests. Credit hours usually depend upon the extent to which the student wishes to do research. Courses of this nature were found in four industrial arts offerings which constituted 12.9 per cent of the offerings examined.

Job Analysis: This course was offered by only one institution which allowed analyzing a problem through shopwork. The one institution comprised 3.2 per cent of the study.

Curriculum Making: Curriculum Making consists of those courses that students work out projects as a method of establishing an industrial arts program. Such subjects as these are now given graduate credit in two (6.4 per cent) of the schools in this study.

Industrial Arts: Industrial Arts is the title given shop work in some institutions without designating the particular area. Eleven colleges, or 35.4 per cent, listed their shop work in this manner.

General Woodwork: Courses of woodwork that embody more than one area of woodwork being taught at the same time in the same shop are classed as General Woodwork. These areas may include bench work, wood turning, etc. The combined courses of woodwork were offered in seven institutions which was 22.5 per cent of the schools studied.

Leatherwork: Leatherwork constitutes only those courses that are primarily devoted to working with leather. It is an independent subject which appeared in three graduate programs. This represented 9.3 per cent of the respondents.

Industrial Electricity: Those courses of electricity which are designed for commercial training are listed as Industrial Electricity. Although specifically designated in five (16.1 per cent) colleges for commercial training, teachers were invited to take the courses for graduate credit.

Art Metal: This title embraces only those courses of metal work such as etching, tooling, etc. Courses of this nature were found in three industrial arts offerings which constituted 9.3 per cent of graduate programs used for this study.

Upholstery: Upholstery consists of those courses of fabric work offered. Automobile upholstery is also carried here as upholstery. This course appeared in four different graduate offerings or 12.9 per cent of thirty-one programs of graduate shopwork.

Carpentry: Specifically designed courses for the teaching of building as an industrial arts subject are referred to in this study as carpentry. The one institution offering Carpentry comprises 3.2 per cent of the schools studied.

Industrial Printing: Those courses of printing which necessitate the manipulation of heavy machinery. In most instances these courses are designed for commercial printing and teacher training. Such courses were found to be given at two institutions which represented 6.4 per cent of the study.

Ceramics: This title applies only to those courses of pottery and associated areas. This area of courses was found in six graduate shopwork programs. The six programs are 19.2 per cent of the thirty-one programs in this study.

Foundry: Foundry includes all courses listed in the bulletin as such. Only one institution listed Foundry as an area for graduate credit. The one institution represents 3.2 per cent of graduate programs used in this study.

Heat Treatment of Metals: This title refers to courses devoted entirely to heat treatment of metal. Two colleges totaling 6.4 per cent of the graduate schools with shopwork had courses of this nature.

Finishing Processes: Finishing Processes constitute courses devoted entirely to finishing of wood and metal as industrial arts projects. Although most of the woodwork courses revealed that finishing processes would be stressed, only three instances were found where this course was free of other courses. The three programs represent 9.3 per cent of the schools studied.

Photography: Photography consists only of those courses of picture taking and film developing. Courses of this nature were listed by two institutions or 6.4 per cent of the thirty-one schools in this study.

Lapidary and Sterling Technique: Courses of jewelry making only are included in this group. This course was revealed in only one graduate program. It represents 3.2 per cent of graduate work surveyed.

Industrial Experiences: Industrial Experiences include those courses where graduate credit is given for factory work or job experience. Two colleges gave credit for work experience. This constitutes 6.4 per cent of the thirty-one colleges in this study.

The above courses represent the total offerings of shopwork classes that may be applied on work toward a graduate degree in industrial arts.

Table II summarizes the number of institutions offering these courses. It also represents a percentage distribution of these courses. Machine Woodworking and Drafting were found to be the most offered courses. Both were offered in sixteen institutions which represented 51.6 per cent of the schools used in the study. Other high ranking courses were Handcrafts, Shop Maintenance, Applied Electricity, Graphic Arts, General Metals, and Industrial Arts. These courses represent 38.7 to 35.4 per cent of the total institutions. The least offered courses were Manual Arts Therapy, Job Analysis, Carpentry, Foundry, and Lapidary and Sterling Techniques. These courses were offered by only one institution, which represents 3.2 per cent of the thirty-one institutions in this study. Other courses were in the range of 38.7 per cent and 3.2 per cent of the study.

TABLE II

FREQUENCY OF SHOP SUBJECTS

Subject	Number of Schools	Percentage of Schools
Plastics	7	22.5
Handcrafts	12	38.7
Machine Woodworking	16	51.6
Applied Electricity	11	35.4
Graphic Arts	11	35.4
General Shop	5	16.1
Construction of Teaching Aids	7	22.5
Aeronautics	4	12.9
Construction Building	2	6.4
Drafting	16	51.6
Radio and Television	3	9.3
Automotive	8	25.8
Sheet Metal	6	19.3
Shop Maintenance	6	19.3
Machine Shop	12	38.7
General Metals	11	35.4
Welding	7	22.5
Manual Arts Therapy	1	3.2
Individual Problems	4	12.9
Job Analysis	1	3.2
Curriculum Making	2	6.4
Industrial Arts	11	35.4
General Woodwork	7	22.5
Leather Work	3	9.3
Industrial Electricity	5	16.1
Art Metal	3	9.3
Upholstery (Fabrics)	4	12.9
Carpentry	1	3.2
Industrial Printing	2	6.4
Ceramics	6	19.3
Foundry	1	3.2
Heat Treatment of Metals	2	6.4
Finishing Processes	3	9.3
Photography	2	6.4
Lapidary and Sterling Techniques	1	3.2
Industrial Experiences	2	6.4

Part C

Accreditation of Shopwork Toward an Advanced Degree

The total number of graduate hours in shopwork courses offered by various institutions is in no way any indication as to how many such hours can actually be applied to an advanced degree. The range of the shopwork course hours varied from 100 per cent of the total hours offered to as low as 11.3 per cent of the total hours offered in shopwork courses. Some instances were revealed where institutions had no limitations to the number of shopwork hours that could be included in the graduate plan of study.

A compilation of data from institutions used in this study has been made for the purpose of enlightening the reader. This enlightenment is one which explains clearly the relationship of the total hours offered in shopwork in the different graduate schools. In addition to this, the relationship shows the number of such hours which may be applied to a graduate degree. The institutions and their shopwork hours are as follow:

A. & T. College: The graduate school of this institution offered sixteen shopwork hours. Fifteen of these hours may be applied to the master's degree. The fifteen hours represent 97.7 per cent of the total shopwork hours offered.

Arizona State College, Tempe: Graduate shopwork hours at this institution represent 100 per cent of shopwork in the graduate school. Two hours of shopwork are in the master's degree study plan and the two may be included in the plan of study.

Arizona State College, Flagstaff: The graduate school at Flagstaff included ninety-seven hours of graduate shopwork, of which only eleven may be contained in a plan of study for teacher training. The eleven hours represent 11.3 per cent of the total shopwork hours offered.

Bradley University: Eight hours represents 11.7 per cent of the fifty-eight hours of shopwork at Bradley University that may be included in the graduate plan of study.

Colorado Agricultural and Mechanical College: This study reveals fourteen hours of shopwork at this institution. Ten of these hours denote 71.4 per cent of total shopwork that may be used for master degree study.

Eastern Kentucky State College: The graduate school of this college lists fifty-seven shopwork hours. Ten of these hours constitute 17.5 per cent of the total shopwork hours that may be included in the graduate plan of study.

Peabody College for Teachers: Shopwork hours for graduate study totaled 17.5 hours. There appears to be no limit as to the number of such hours that may be employed for credit toward the master's degree.

Indiana State Teachers College: At this institution, 12.5 semester hours are offered in shopwork at the graduate level. There is no indication of how many of these may be applied toward the master's degree.

Illinois State Normal University: The graduate school of Illinois State Normal University has three shopwork hours in industrial arts. All three hours may be applied to a graduate degree.

Kansas State College, Manhattan: Shopwork is given credit in the graduate school, however, no specific number of shopwork hours is designated in the graduate study.

Kent State University: This university includes 50.6 shopwork hours in the graduate school. Thirty-three and two-tenths per cent, or 16.7 semester hours, may be used for the requirements of the master's degree.

Miami University: Of eighteen semester hours of graduate shopwork, only four (22.2 per cent) may be used for master's degree requirements.

Middle Tennessee State College: Fifty-four shopwork hours are offered by the graduate school. Eighteen of these hours represent 33.3 per cent of the total hours offered which may be used in the master's degree plan of study.

San Jose State College: Eighteen of the 39.9 hours of shopwork in the graduate school of industrial arts may be applied toward the master's degree. The eighteen hours are 40.1 per cent of the total offerings of shopwork hours.

State College of Washington: One hundred per cent of the shopwork hours in the graduate listings may be included in the study of the master's degree. Four hours were offered.

State University of New York, Teachers College, Oswego: The study revealed shopwork courses for graduate credit. The hours of credit for such courses are at the discretion of the advisor.

Tennessee A. & I. State University: Courses totaling twelve hours constituted the graduate hours of shopwork. One hundred per cent of these courses may be included in the plan of study for the master's degree.

Texas College of Arts and Industries: Forty-six and one tenth per cent of the thirty-nine hours of shopwork may be applied toward the master's degree study. Eighteen hours may be used in the plan of study for the master's degree.

The Agricultural and Mechanical College of Texas: The graduate school of this college lists twelve hours of shopwork. Of the twelve, only ten hours (83.3 per cent) may be honored for credit toward the master's degree.

The Oklahoma Agricultural and Mechanical College: Twenty-six hours of shopwork are approved by the graduate school. Of the twenty-six hours, this study revealed no limitations of the number of hours which may be used for graduate credit.

The Stout Institute: The graduate school enumerates six hours of shopwork. Two of these hours may be included in the plan of study for the master's degree. The two hours represent 33.3 per cent of the hours offered.

The University of Florida: One hundred per cent of the total shopwork courses or fifteen hours offered by the graduate school may be accredited to master's degree study.

The University of Georgia: The total 3.3 hours of graduate shopwork catalogued by the graduate school may be included in the master's degree study.

Wayne University: There are sixteen hours of shopwork registered in the graduate school. All sixteen hours are recommended for graduate study.

Western Michigan College: Thirty-eight hours of shopwork are included in the graduate study. Fifteen hours, or 38.4 per cent, may apply directly to requirements for the degree.

Western Washington: Twenty-two of the total twenty-eight hours of shopwork approved by the graduate school may be used for master's degree credit. The twenty-two hours represent 78.5 per cent of graduate shopwork in industrial arts education.

North Carolina State College: Eight hours of graduate work in shopwork are listed in the master's degree study course. One hundred per cent (eight hours) may be included in the master's study plan.

North Texas State College: The graduate school of industrial arts education approves fifty per cent, or twelve hours, of the twenty-four hours offered for the master's plan of study.

Ohio University: There are six hours of graduate shopwork. All six hours may be included in the plan of study for master's degree requirements.

Sam Houston State Teachers College: One hundred per cent of the six hours offered by the graduate school may be used for master's degree credits.

East Texas State Teachers College: A high of seventy-four shopwork hours are offered for graduate study. Of the seventy-four, only fifteen (20.2 per cent) are permitted on the master's degree plan of study.

Table III summarizes the per cent of shopwork hours the various institutions honor for graduate study. Also shown in Table III is the total hours of shopwork contained in the graduate schools of this study. Arizona State College, Flagstaff, Arizona, listed the greatest number of shopwork hours and also the lowest per cent of total hours which may be applied toward the master's degree. It may be noted that the older institutions of higher learning offered fewer shopwork hours on the graduate level and at the same time had a higher per cent of shopwork hours which may be included in the master's degree study. (See page 50)

TABLE III

APPROXIMATE NUMBER OF SHOPWORK HOURS APPLICABLE TOWARD THE MASTER'S DEGREE

School	Shopwork Hours	Applicable Hours	Per Cent Applicable
A. & T. College	16	15	97.7
Arizona State College, Tempe	2	2	100.0
Arizona State College, Flagstaff	97	11	11.3
Bradley University	58	8	13.7
Colorado Agricultural and Mechanical College	14	10	71.4
Eastern Kentucky State College	57	10	17.5
George Peabody College for Teachers	17.5	-	-
Indiana State Teachers College	12.5	-	-
Illinois State Normal University	3	3	100.0
Kansas State College, Manhattan	-	-	-
Kent State University	50.6	16.7	33.2
Miami University	18	4	22.2
Middle Tennessee State College	54	18	33.3
San Jose State College	39.9	16	40.1
State College of Washington	4	4	100.0
State University of New York, Teachers College, Oswego	-	-	-
Tennessee A. & I. State University	12	12	100.0
Texas College of Arts and Industries	39	18	46.1
The Agricultural and Mechanical College of Texas	12	10	83.3
The Oklahoma Agricultural and Mechanical College	26	-	-
The Stout Institute	6	2	33.3
The University of Florida	15	15	100.0
The University of Georgia	3.3	3.3	100.0
Wayne University	16	16	100.0
Western Michigan College	38	15	38.4
Western Michigan College	28	22	78.5
North Carolina State College	8	8	100.0
North Texas State College	24	12	50.0
Ohio University	6	6	100.0
Sam Houston State Teachers College	6	6	100.0
East Texas State Teachers College	74	15	20.2

CHAPTER V

SUMMARY AND CONCLUSIONS

The question of manipulative courses versus professional courses for graduate credit in teacher training institutions has gained momentum during the past two decades. The early graduate studies consisted entirely of methods. Manipulative work was considered completed in the undergraduate school. Several factors have influenced shopwork for graduate credit: (1) state certification has been the determining cause for undergraduate schools to delete some shopwork courses; (2) the need of industrial arts teachers to broaden their manipulative skills in order to cope with advancing industrial processes; and (3) new methods and techniques employed in teaching industrial arts courses.

This study has been concerned with the development of graduate study in industrial arts education and shopwork courses given graduate credit in the colleges and universities of the United States. The purpose of this study has been to determine to what extent graduate schools of America are meeting the demands of present and future industrial arts teachers in developing manipulative skills. To accomplish the objective, the writer requested bulletins of every known institution in the United States awarding graduate degrees for study of industrial arts education. Of eighty-three inquiries mailed, seventy-one responded. An analysis of the seventy-one bulletins and catalogs revealed that thirty-one institutions accredited shopwork courses toward advanced study.

Growth of Graduate Schools of Industrial Arts Education. Graduate schools of America had their inception with the Rensselaer School which, though not noted for advanced training in industrial arts education, did emphasize activities of an industrial nature. An accelerated growth of institutions with studies leading toward an advanced degree in industrial arts education began with the passing of the Morrill Act of 1862. A recess is noted from 1884 until 1935. During this time there was a great change in the organization of graduate study. From 1935 to the present, the number of graduate schools of industrial arts education has more than doubled itself. Some early institutions of graduate study of industry are: Teachers College of Columbia University, Kansas State College at Manhattan, The Agricultural and Mechanical College of Texas, Louisiana State University, and the Oklahoma Agricultural and Mechanical College.

Advanced Degrees for Industrial Arts Education. Early advanced degrees were awarded on a somewhat merit basis. The recipient, upon recommendation, paid a fee and received the degree. It is generally believed by this writer that some noteworthy accomplishment had to be made before the recipient was recommended. A later method authorized the department head to arrange a list of studies. Upon completion of these studies the candidate was passed upon by a council. This method exists in minute form in some institutions today. At present the graduate school certifies courses of graduate level, and the candidate must satisfy its requirements.

In 1882 Louisiana State University announced studies leading to the degree "Graduate of Mechanics", and made the reference that the master of arts degree required an additional year of study. The first college

offering graduate degrees for the study of manual training was Teachers College of Columbia University in 1897.

The present day graduate degrees for study of industrial arts courses usually are the master of science or the master of arts. This survey shows that sixteen of the thirty-one schools awarded these two degrees. Five institutions awarded a master of education, one a master of science in education, and two a master of science in industrial arts.

Summary of Shopwork Courses. An analysis of the shopwork courses of thirty-one institutions revealed that courses of machine woodworking and drafting are offered in sixteen graduate schools. Other high ranking areas offered in eleven or more schools are handcrafts, applied electricity, graphic arts, machine shop, general metals, and industrial arts. Courses offered in only one institution included manual arts therapy, job analysis, carpentry, foundry, and lapidary and sterling techniques. Other low ranking areas offered in two or three schools include construction building, radio and television, curriculum making, art metal, industrial printing, heat treatment of metals, photography, and industrial experiences.

Credit for Shopwork. The number of shopwork semester hours included in the graduate studies have no bearing on the number of hours that may be applied to the graduate degree, as disclosed in the graduate study. One institution included ninety-seven semester hours of manipulative work with only eleven applicable toward a degree. Another institution offered sixteen shopwork hours with all sixteen being applicable to an advanced degree. Ten of the thirty-one institutions of this study accredited all

shopwork in the graduate school toward an advanced degree. The trend appears that the older institutions include fewer shopwork hours for graduate study, and at the same time allow a greater percentage of shopwork hours toward a master's degree. Because of this, several questions arise in the writer's mind. (1) Why should the leaders in the field sense so little need for manipulative skills at graduate level? (2) Are the younger institutions substituting needed professional training for manipulative courses? (3) What are the timely determining factors in placing manipulative courses on graduate levels?

Federal Influences. Despite the fact that no special section of this study is devoted to the federal influences on industrial arts education, and in particular on shopwork, the writer feels a need to review some influences on graduate schools. Four important acts gave impetus to the establishment of graduate schools. The first of such acts was the Morrill Act of 1862. In essence, this act provided means for establishing schools of mechanic arts. Since there was no directive as to what extent colleges should train under this act, many institutions extended their courses through the graduate school. Kansas State College at Manhattan was founded as a degree giving institution as the result of the Morrill Act of 1862. The second act of importance was the Civilian Conservation Corps of the early thirties. Young men were trained in colleges to lead the activities of this program. The third act, National Youth Administration, provided subsistence for certain youth in college training with the provision that they pursue education of an industrial nature. The fourth act, Veterans' Rehabilitation Act, encouraged veterans to train for industry. Many veterans who had earned their bachelor's degrees

requested additional training. In order to cope with these demands, many colleges gave new meaning to courses. Due to the great expansion of shopwork courses after the passing of the Veterans' Rehabilitation Act, the writer is inclined to accept this act as the greatest influence of shopwork in the last decade.

Summary of Events Affecting Graduate Training in Industrial Arts Education. The writer has compiled these dates and events to present in chronological sequence the progress of graduate study in industrial arts education. These events may also reflect the elevation of shopwork courses to graduate status.

1824 Stephen van Rensselaer established the Rensselaer School which later became the first graduate school of America.

1862 President Abraham Lincoln signed into effect the Morrill Act. "By the terms of the Land-Grant Act, 30,000 acres of public land per senator and representative in Congress were granted to provide Colleges of agriculture and the mechanic arts in several states." (6, page 358)

1874 Industrial courses opened at the Kansas State Agricultural College. The first instance of industrial courses designed for teacher training.

1877 Dr. Calvin Woodard introduced shopwork as a part of general education at Washington University, St. Louis.

1897 Teachers College of Columbia University announced a graduate course in the pedagogy of manual training. This was the first such course offered in any American institution.

1904 Charles Richards suggested that the name "industrial arts" be substituted for "manual training".

1917 National Vocational Education Act (Smith-Hughes Act) was signed by President Wilson on February 23, 1917. This act provided vocational instruction in secondary schools for industrial subjects.

1933 Establishment of Civilian Conservation Corps to give relief, employment, and vocational training for unemployed youths. (6, page 621)

1935 The National Youth Administration established to provide work for unemployed youth and give vocational training for youth while attending college.

1944 The Serviceman's Readjustment Act provided tuition for returning servicemen, also provided supplies and subsistance while attending college.

Recommendations for Further Study. If the industrial arts departments in the secondary schools are to teach industrial processes to the children, and if industry continues to find new ways and methods of producing products, the shop teacher will always have a degree of lack of knowledge about the latest industrial techniques. The writer believes that if more colleges and universities were to offer industrial arts shopwork courses on the graduate level, more industrial arts teachers would seek to improve their knowledge and manipulative skills. For the reason stated above, the writer is convinced that studies should be made in the following areas.

1. An investigation to determine why some schools offer industrial arts shopwork for graduate credit while others do not. It was noted in this study that only thirty-one of seventy-one institutions investigated permitted graduate credit for shopwork or manipulative courses.

2. There should be an effort made to develop criteria for determining how many laboratory or shopwork credits may be permitted in the graduate plan of study for industrial arts education. This study revealed that some schools allowed as much as eighteen semester hours and some only two.

3. An investigation should be made to determine the deficiency of undergraduate students in industrial arts shopwork. Gimbel's study (20) disclosed that a great percentage of industrial arts teachers desire to take manipulative courses, but wish to receive graduate credit.

The writer further believes that if the above stated areas are investigated and the findings published, a visual improvement will be made in the industrial arts departments of the graduate schools in the United States.

APPENDICES

A. Selected Bibliography

B. Directory of Schools Studied

C. Letter of Transmittal

D. Geographic Location of Respondents

Appendix A

SELECTED BIBLIOGRAPHY

Books

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Appendix B

DIRECTORY OF SCHOOLS STUDIED

Alabama Polytechnic Institute, Auburn, Alabama

Arizona State College, Flagstaff, Arizona

Arizona State College, Tempe, Arizona

Ball State Teachers College, Muncie, Indiana

Bradley University, Peoria, Illinois

Bowling Green State University, Bowling Green, Ohio

Chico State College, Chico, California

Colorado Agricultural and Mechanical College, Fort Collins, Colorado

Colorado State College of Education, Greeley, Colorado

East Texas State Teachers College, Commerce, Texas

Eastern Illinois State College, Charleston, Illinois

Eastern Kentucky State College, Richmond, Kentucky

Eastern New Mexico University, Portales, New Mexico

Fresno State College, Fresno, California

George Peabody College for Teachers, Nashville, Tennessee

Howard University, Washington, D. C.

Illinois State Normal University, Normal, Illinois

Indiana State Teachers College, Terre Haute, Indiana

Kansas State College, Manhattan, Kansas

Kansas State Teachers College, Pittsburg, Kansas

Kent State University, Kent, Ohio

Louisiana State University, Baton Rouge, Louisiana

Miami University, Oxford, Ohio

Michigan State College, East Lansing, Michigan

Middle Tennessee State College, Murfreesboro, Tennessee

Murray State College, Murray, Kentucky

New Mexico Highlands University, Las Vegas, New Mexico

New York University, New York, New York

North Carolina State College, Raleigh, North Carolina

North Texas State College, Denton, Texas

Ohio University, Athens, Ohio

Prairie View Agricultural and Mechanical College of Texas, Prairie View, Texas

Purdue University, Lafayette, Indiana

Sam Houston State Teachers College, Huntsville, Texas

San Diego State College, San Diego, California

San Francisco State College, San Francisco, California

San Jose State College, San Jose, California

South Carolina State College, Orangeboro, South Carolina

Southern Illinois University, Carbondale, Illinois

Southwest Texas State Teachers College, San Marcos, Texas

State University of New York, College for Teachers, Buffalo, New York

State University of New York, Teachers College, Oswego, New York

State College of Washington, Pullman, Washington

Sul Ross State College, Alpine, Texas

Teachers College, Columbia University, New York, New York

Tennessee Agricultural and Industrial State University, Nashville, Tennessee

Texas College of Arts and Industries, Kingsville, Texas

The Agricultural and Mechanical College of Texas, College Station, Texas

The Agricultural and Technical College of North Carolina, Greensboro, North Carolina

The Ohio State University, Columbus, Ohio

The Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma

The Pennsylvania State University, State College, Pennsylvania

The Stout Institute, Menomonie, Wisconsin

The University of Florida, Gainesville, Florida

The University of Georgia, Athens, Georgia

The University of Miami, Miami, Florida

The University of Minnesota, Minneapolis, Minnesota

The University of Pennsylvania, Philadelphia, Pennsylvania

The University of Tennessee, Knoxville, Tennessee

University of Illinois, Urbana, Illinois

University of Maryland, College Park, Maryland

University of Wyoming, Laramie, Wyoming

Utah State Agricultural College, Logan, Utah

Walla Walla College, College Place, Washington

Wayne University, Detroit, Michigan

West Texas State College, Canyon, Texas

West Virginia University, Morgantown, West Virginia

Western Michigan College, Kalamazoo, Michigan

Western Washington College, Bellingham, Washington

Wisconsin State Teachers College, La Crosse, Wisconsin

Appendix C

OKLAHOMA INSTITUTE OF TECHNOLOGY
OF THE
OKLAHOMA AGRICULTURAL AND
MECHANICAL COLLEGE
SCHOOL OF INDUSTRIAL ARTS EDUCATION
AND ENGINEERING SHOPWORK
STILLWATER, OKLAHOMA

Dear Sir:

I am a graduate student at Oklahoma Agricultural and Mechanical College and am interested in the offerings of shopwork on the graduate degree level in the several colleges in the United States who are offering graduate degrees in industrial arts education.

I would appreciate very much a copy of your college catalog for assistance in this work. When work is completed on the study, the catalog will be placed in the library of the above school of industrial arts.

Please address the catalog to my advisor, Professor C. L. Hill.

Sincerely,

Warren M. Berry
Graduate Student

Approved by,

C. L. Hill

Report Advisor and
Associate Professor,
School of Industrial Arts
Education and Engineering
Shopwork

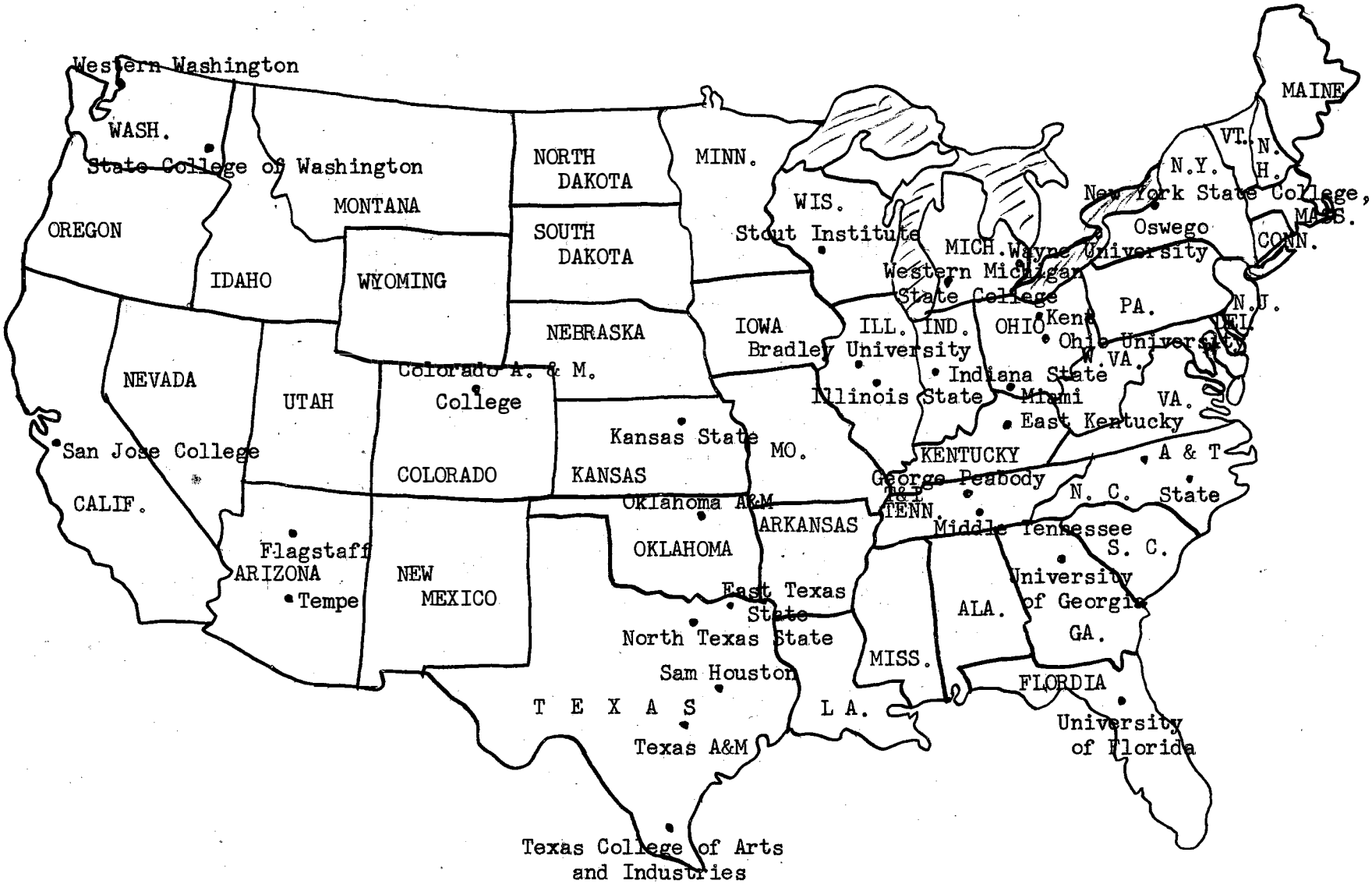

Figure I. Geographic Location of Institutions for This Study

VITA

Warren Masters Berry
Candidate for degree of
Master of Science

Report: GRADUATE CREDIT FOR INDUSTRIAL ARTS SHOPWORK IN COLLEGES AND UNIVERSITIES OF THE UNITED STATES

Major: Industrial Arts Education

Biographical and Other Items:

Born: November 29, 1920, at Fort Gibson, Oklahoma

Undergraduate Study: Langston University, January 1939 to June 1942 and September 1946 to June 1947.

Graduate Study: Oklahoma Agricultural and Mechanical College, Summers of 1952, 1953, 1954 and 1955.

Experiences: United States Army, 1942-46; Instructor of carpentry, Southwestern College of Industrial Arts, Fort Worth, Texas, 1947-48; Instructor of carpentry, McDonald College of Industrial Arts, Fort Worth, Texas, 1948-49; Coordinator of Instruction, McDonald College of Industrial Arts, Fort Worth, Texas, 1949-50; Principal, Euless Elementary School, Euless, Texas, 1950-52; Industrial Arts Instructor, Fort Worth Public Schools, Fort Worth, Texas, 1952- .

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