A PROPOSED PLAN FOR SELECTION OF TEXTBOOKS AND REFERENCE BOOKS FOR THE INDUSTRIAL ARTS LIBRARY

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L. A. P.

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CHAPTER I.

THE SCOPE AND ORGANIZATION OF STUDY

Industrial arts in its present day concept is a comparative newcomer in the educational program. Though its progress has been continual and its contribution to general education has been more meaningful in the last few decades, it still faces a deficiency in the field of textbooks, reference books, and similar related materials. The wealth of information available in these books is probably not used by the majority of industrial arts teachers because they have failed to have any experience which brought them in contact with such materials. A factor which led to this study was the belief that if properly administered this phase of the program could add considerably to its strength and stature.

PART A.

PHILOSOPHIES CONCERNING RELATED MATERIALS

During the earlier part of the industrial arts movement, there were two schools of thought as to the method of teaching. One group of teachers contended that textbooks and reference materials were an essential factor in good instruction. The opposition contended that textbooks impair pupil interest, that their absence in the school shop program was the main reason students enjoyed the work.

Use of Textbooks and Related Materials. There are several

schools of thought concerning the use of the textbook in classroom instruction today:

> (1) Exceptionally experienced teachers often declare that in their classrooms they do not use textbooks. They may find no vital fault with any one of the better texts; their objection is to textbooks as such. They prefer to supply the content of their courses from various selected materials.
>
> (2) At the other extreme are the teachers who begin with page 1 on the first day of school and trust that they will reach the last page not too long before the end of the school year. Such teachers bring little imagination to their problems. Any course they teach remains the same from year to year so long as they use the same textbook. (20, page 63)

The writer feels that neither of these groups has a clear understanding of the use of the textbook. The textbook gives indispensable help to both the teacher and the student, but just as no one cookbook contains all the recipes a cook might want, no textbook contains all the good ideas available in any field. It is for this reason that a school shop library composed of the best books in every field offered in the high school curriculum is proposed.

This philosophy is in accord with that of Greeley and Hahn who contend that:

> The text is neither a crutch to be thrown away, nor a series of decrees to be slavishly followed. It is rather a basic content and a central core of material which reflects experiences and opportunities far greater than those available to any one teacher. This guide can point the way, can show the easiest terms in which to present a troublesome concept, can offer both a goal and varied means of reaching it. A good textbook enriches each subject field and every educational method. (20, page 86)

Origin and Need of the Study. The germ idea of this study was planted in the mind of the writer when, as an undergraduate student teacher, he was impressed by the lack of organization apparent in industrial arts classes. The poor organization was probably attributable to the absence of a textbook or guide book in a field adequately supplied with many excellent texts. The writer was in complete accord with the prevailing belief that no one textbook was the "best" textbook in any field, did not believe in page by page teaching, nor advocate the notextbook type of teaching being sanctioned by fellow industrial arts teachers.

If a textbook were to be used, which "one" to be selected from among all the others became the question pre-eminent as the writer began his teaching. Actual classroom teaching further convinced the writer that one text would never satisfy the needs in the industrial arts classroom.

When the time came for the writer to select a topic for study the possibility of a school shop library to enrich the industrial arts program and to eliminate the page by page teaching done by conventional teachers or the haphazardly organized work of the "non-text" teachers seemed both an interesting and wise idea. Thus was begun a search for the best books available in fifteen areas of industrial arts education, and eventually, the compiling of a bibliography for an industrial arts library.

Purpose of the Study. It is the purpose of this study to

show that one textbook as such is not a sufficient source of material for any course of study; to point out that a collection of source materials in every field of endeavor should be available in the school shop; and to present an annotated bibliography of books selected in the fifteen most frequently offered courses.

Definition of Significant Terms. In making this study, it became necessary to think through and clarify a personal philosophy concerning the place of industrial arts in the school curriculum, to establish the objectives which the program should accomplish, and to define four terms significant to the study. The first three of the terms listed have been defined satisfactorily by authorities in the field; the fourth came about as a result of this study:

> General Education has as its purpose to provide rich and meaningful experiences in the basic aspects of living, so directed as to promote the fullest possible realization of personal potentialities and the most effective participation in a democratic society. (28, chapter 2, page 1)

> Industrial Arts is a study of the changes made by man in the forms of materials to increase their values, and of the problems of life related to these changes. (5, page 2)

> Industrial Education is a generic term including all educational activities concerned with modern industry and crafts, their raw materials, products, machines, personnel, and problems. It therefore includes both industrial arts and vocational industrial education. (14, page 7)

> Industrial Arts Library is a collection of textbooks, project books, professional books, and reference books pertaining to the industrial arts field which are housed in the planning center of the industrial arts department. These books should be classed as "reserve" books and should not circulate outside the industrial arts department

except in cases of specific need.

Studies of Similar Nature. A search of the library revealed very little information regarding the industrial arts library. Only two theses were found pertaining to this subject. Summaries of both are given below.

The Use of Books and Magazines in the Teaching of Industrial Arts in Oklahoma, a masters degree thesis written by Elden Theodore, Wagner, Oklahoma Agricultural and Mechanical College, in 1929 will be considered first. The following statements summarize this thesis.

1. Of the schools answering the question concerning library appropriations 17 per cent receive a definite appropriation for the industrial arts department while 63 per cent receive no definite amount.

2. In schools where money is available for industrial arts books, 90.11 per cent of the books are selected by the teachers in charge of the department; 3.28 per cent are chosen by a committee of industrial arts teachers; and 6.58 per cent are selected by superintendents and principals.

3. In the case of periodicals received by the library, 15.93 per cent of the schools bind them in volumes and keep them in the shop. In 13.27 per cent of the schools, the magazines are clipped and kept in a file or a separate book. In 41.59 per cent of the schools the magazines were left unbound in the department, while 17.69 per cent placed them in the school library.

4. Of particular importance was the "Management of Shop Books." This phase of the study revealed that 88 per cent of the departments permitted students to have full access to books while 11 per cent kept books under lock and key.

5. In regard to checking out books, 52 per cent reported that students were allowed to check books overnight while 48 per cent indicated that this privilege was denied.

6. In regard to the housing of library books, 54 of the teachers reporting kept their books in the library part of the time and in the shop part of the time. Teachers in 29 schools kept all their books in the shop, while 4 kept them in the school library, and 14 reported that they had no reference books at all.

The second thesis examined was A Survey of the Industrial Arts Libraries in Junior and Senior High Schools With an Enrollment of 200 or Over, Located in the Eastern Half of Iowa, written by Frank M. Everhart, Iowa State College.

This study was made to determine the extent of library facilities and services available to industrial arts students and teachers in the state of Iowa. It was based on the data available in the eastern part of the state. A companion study was made of the western part of the state by Harold Dewitt Matt.

The following conclusions were drawn:

1. In the shops surveyed, 64.9 per cent had libraries located in the shop or drawing room.

2. Of the libraries listed, only 38.5 per cent had a definite appropriation for purchasing books.

3. In 63.1 per cent of the libraries mentioned, the instructor purchased or selected the book.

4. Of the libraries listed 40.3 per cent allowed no books to circulate outside of the shop.

5. In these libraries, only 8.7 per cent had trouble with the books disappearing.

6. Of these libraries there was more interest in periodicals than in books; 59.6 per cent listed more interest in periodicals.

7. In 35.08 per cent of the shops surveyed no method was used to get pupils to use the libraries.

8. In 7.01 per cent of these libraries, the periodicals were bound.

Predicted Results of Investigation. Teachers in the field of industrial arts will find the "Bibliography of Textbooks and Reference Books" very helpful in the building of a school shop library. This annotated bibliography will give both the

experienced and inexperienced teacher confidence in the matter of book selection and will point out the relative proportion of books to be purchased for each industrial arts subject.

All persons training for industrial arts teaching should be required to make a survey of the textbooks and reference books available in the field. The knowledge acquired in such an undertaking would surely offset the complete unawareness of existing helpful material which seems to characterize industrial arts teachers.

It is not thought that any one school could be fortunate enough to purchase all the books suggested in the bibliography. In many schools classes are not offered which would be directly related to the books suggested, but it is hoped that the bibliography can serve as a guide for those teachers who are attempting to build industrial arts libraries. It is also hoped that school librarians who have charge of the selection of books in the industrial arts field will find the bibliography helpful.

The background of this study will be given in Part B of this chapter.

PART B.

THE ROLE OF THE LIBRARY IN EDUCATION

The word library is derived from the Latin word <u>libraria</u> which means a place where written documents or books are kept.

The word library is defined today as a collection of books for the purpose of study or reading, not for sale.

Earliest Libraries. The earliest known library dates back to 2000 B. C. It was a collection of clay tablets belonging to the Babylonian civilization. As early as 600 B. C. there was an unusually large library of 10,000 volumes in the palace of King Assurbanipal at Minevah. This Assyrian library was classified according to subject and the books were methodically arranged showing the early existence of some form of library science.

In Egypt there were libraries in 300 B. C. The first Egyptian Libraries of which there is record were the twin libraries of Alexandria which eventually contained between 600,000 and 700,000 volumes.

The first Roman libraries were brought back to Rome as the spoils of war in 150 B. C., but by the year A. D. 300 Rome had nearly thirty public libraries. The Emperor Constantine moved the capital of the Roman Empire to Constantinople in A. D. 330, where he established one of the largest libraries of the Roman civilization.

The Middle Ages. One of the results of the fall of the Roman Empire was that men forgot about such things as books and libraries. Only monks in monastaries continued to try to preserve knowledge and culture. It was they who established libraries where manuscripts might be copied. One such group, the Franciscan Monks, built the world famous

library in 1253 at Oxford, England.

> None of these monastic libraries of the Middle Ages was large. But they performed a great service to the world. Their carefully preserved library and painstaking copying of manuscripts saved much of the Latin and Greek literature which we still treasure today. (21, page 419)

Renaissance Libraries. The revival of learning of the 1300's aroused a new interest in culture and education. The people of this age developed a great interest in non-religious literature and in the ancient classics. Libraries were established. Then came the invention of the printing press which caused great libraries to spring up throughout Europe. Although printing was slow in creating a demand for libraries in England, there was established in London in 1753 a library the British Museum which is today the most valuable library in the world.

In the United States. The first American colonists, realizing their need for all the cultural advantages which could be gained through study, soon established schools for the purpose of educating their sons. In 1638 the first colonial library was established in Connection with Harvard College. Rev. Thomas Bray of England sent a collection of 2,500 books to New York City in 1698 to be used for a library for both clergymen and the general public.

Gradually libraries were established in every part of the United States. Andrew Carnegie, a leader in the steel industry, gave more impetus to the library movement than any one other man when he donated money for the erection of 2,500

free public library buildings.

Departmental and Classroom Libraries. Modern educational methods encourage the use of the library. This is one of the chief reasons why American schools have specialized in building attractive and adequate school libraries. These libraries are of several types. One type houses all the books in one separate room while others specialize in classroom library collections.

For each phase of the modern school curriculum one definite type of library is perhaps better than any other. There is today a concerted effort on the part of trained library workers to arrange the housing of all library books in one central place. There probably are some specialized areas which should retain and improve their classroom libraries because of the special needs for "the right book at the right time" with absolutely no delay. In this group of special libraries should be included the industrial arts department. Gordon C. Wilber, is in complete accord with this declaration. He says, "Every planning center should have its shop library." (32, page 188)

Lucile F. Fargo, former librarian in North Central High, Spokane, Washington and member of the headquarters' staff of the American Library Association, says that one of the seven functions of a library is to provide classroom collections. (13, page 37)

The philosophy of a movement and its history are closely

connected. The expanding philosophy of industrial arts education will be discussed in the next chapter.

CHAPTER II.

THE EXPANDING PHILOSOPHY OF INDUSTRIAL ARTS EDUCATION

Every industrial arts teacher has a philosophy concerning industrial arts education. This philosophy may be either good or bad, conservative or progressive, realistic or impractical, but it is still a philosophy and as such will ultimately decide the aims, objectives, and attitudes which prevail in the classroom, and the learning achievements gained there.

PART A.

HISTORICAL BACKGROUND

A philosophy of industrial arts education must necessarily have preceded the introduction of the first "manual training" class in American public schools. To show what some of these early philosophies were, where they had their beginnings, and the influences which they have shed upon the currently prevailing philosophies in industrial arts education is the purpose of this chapter.

Beginning Philosophies. The currently existing philosophy of industrial arts education is not something apart from the philosophy of general education, but is one of its integral parts. Robert Hardin, Chairman of the Department of Industrial Arts Education, University of Oklahoma, writes, "We have always had a basic philosophy of industrial arts. It is and always has been the welfare of the common man." (18, page 179) Hardin further states:

> We are prone to think of industrial arts as a new area in education, but it is not. It is the oldest form of education known to man. Industrial arts antedates academic instruction by many thousands of years, but did not become a part of what later was called formal school education because, for many centuries, education was not for the masses but for the sons of princes, lords, and wealthy landowners. Learning in skills passed from father to son by imitative processes. Many writers on industrial arts quote educational philosophy as far back as the Renaissance, but documentary evidence of practical or useful education dated back almost 4000 years. Stone tablets excavated at Ur in Chaldea revealed laws under which young people learned how to do things. (18, page 179)

A brief review of medieval philosophical history gives evidence that industrial arts is not new in education.

Medieval History. One of the earliest writers in the field of industrial education was John Amos Comenius, who lived in the seventeenth century.

> His advocacy of industrial education in schools is one of the most striking features of his Great Diactic, a work remarkable for the extent to which it anticipates in the seventeenth the more important educational reforms of the nineteenth and twentieth centuries. He provides for industrial education in three of the four schools which constitute his complete system. (2, page 13)

Comenius evidenced a concern that appreciation be a part of the philosophy of handwork. It was Comenius who said that children should study the industries in order "that they may not be too ignorant of what goes on in the world about them. (2, page 15)

John Locke believed that training in the industrial occupations would cause one to know how to use his leisure time

in a worthy manner. He advocated "for the English gentleman a training in gardening, woodworking, and other industrial occupations, mainly as a means of recreation, but also as a means of acquiring skill and experience. (2, page 21)

Like Locke, Jean Jacques Rousseau believed that industrial arts could furnish a much needed, valuable means of recreation. Rousseau felt that exercises of the body and the mind could well serve as recreation for each other. Another basic idea which Rousseau advocated was that training in a trade by every boy would cause both rich and poor alike to recognize the dignity of manual labor, thus helping one to understand the dependence of man upon his fellow men thereby increasing his respect for the work of others.

Sir William Petty's plan for industrial education aimed to provide the young that vocational guidance which is currently the aim of much of current educational effort. This was perhaps the first glimmering of this so-called modern trend in educational philosophy.

Johann Julius Hecker, a student of Francke, became interested in a project for the better adaptation of school work to the needs of the people, with special interest in those who were to take up industrial occupations. This philosophy of fitting the right person with the right job rather than to subject all to the same type of studious pursuits was definitely a trend in the direction of the personalized education stressed today.

John Henry Pestalozzi believed that children should learn to work, not for economic value, but because the experience found in work gives a sense impression which is important in education. He had the firm conviction that the actual projects or objects worked with were not important, but that the training gained while working was the important factor.

Early American Concepts. These European philosophies soon invaded American schools where they were championed or discredited by both schoolmen and laymen. Among the early champions of industrial education in the United States was President Hoar of Harvard who in 1672 wrote to a friend, Boyle, that he planned for his students in addition to the traditional subjects "a large, well-sheltered garden for planting" and "an Ergasterium for mechanic fancies." (2, page 23)

Thomas Budd, an American Quaker, published a paper in 1685 which proposed a plan for schools in New Jersey and Pennsylvania which provided handicrafts for the "boys".

In the mid-seventeen hundreds, Benjamin Franklin, who was always keenly interested in the mechanic arts, planned an academmy. When this school opened, its course of study clearly outlined the correlation which should be achieved between history and industrial and commercial pursuits.

Thomas Jefferson, another educational leader of the pre-revolutionary and post-revolutionary periods, tried to integrate industrial and general education with the more formal cultural studies of that day.

The development of industrial education in the United States was much simpler than in Europe because the United States was influenced by both the failures and successes in this field which had been tried in the Western world.

Effect of the Land Grant Act. The Kansas State Agricultural College, established under the Land Grand Act of 1862, was a pioneer in the field of industrial and agricultural education. The purpose of this school was to give special attention to instruction in agriculture and the mechanic arts, which the student would be allowed to pursue in addition to his literary subjects. As is evidenced here, industrial education was rising, though slowly, to the place of prominence which it occupies today.

It was the philosophy of Professor C. M. Woodward which brought into being the new type of secondary school, the manual training school. The purpose of the first manual training school in America, the Manual Training High School of Washington University, St. Louis, Missouri, established in 1879, was stated in the ordinance which created it. Bennett quotes Woodward as follows, as to the nature of the St. Louis Manual Training School.

> Its object shall be instruction in mathematics, drawing, and English branches of a high-school course, and instruction and practice in the use of tools. The tool instruction, as at present contemplated, shall include, carpentry, wood turning, pattern-making, iron chipping and filing, forge work, brazing and soldering, and the use of machine shop tools, and such other instruction of a similar character as may be deemed advisable to add to the foregoing, from time to time.

> The students will divide their work hours, as nearly as possible, equally between mental and manual labor.
>
> They shall be admitted, on examination, at not less than fourteen years of age, and the course shall continue three years. (4, page 347)

Even with this new type of school proving to be a success there was from 1880 to 1890 a period of controversy over the new type of school in which shopwork was taught. This controversy first started at the annual summer convention at Saratoga, New York in 1882.

Dr. E. E. White, who was at that time president of Purdue University, in speaking of the recommendations which came out of the Saratoga meeting said: "The doctrine that the public schools should cover the whole domain of education saps the very foundation of the public school system, puts a magazine under it, and then lays a train out to fire it." John S. Clark said that there should be no issue between industrial training and literary training, because both were needed in a sound course of mental training. Dr. C. M. Woodward emphasized the importance of that he called "making good workmen" as well as "educated intellects."

Woodwards Influence. Later Woodward began to talk less about the original purpose of the school which was to give boys a better education toward a variety of occupations in the industries and talked more about the general educational value of manual training. Woodward believed that the work shop stimulated interest either directly or indirectly in the

other school courses such as mathematics, physics and many others.

At the convention of the National Education Association, which was held in Saratoga, New York in 1883, Woodward spoke on "The Fruits of Manual Training." In this address Woodward gave his claims for manual training:

> (a) larger classes of boys in the grammar and high schools; (b) better intellectual development; (c) a more wholesome moral education; (d) sounder judgements of men and things, and of living issues; (e) better choice of occupations; (f) a higher degree of material success, individual and social; (g) the elevation of many of the occupations from the realm of brute, unintelligent labor, to positions requiring and rewarding cultivation and skill; (h) the solution of labor problems. (4, page 362)

During the following period much discussion on the subject of the manual training school was common. There were to be two schools of thought on the purpose of this type of training. Dr. Woodward was a strong advocate of its value to general education, while Dr. Harris advocated its vocational value.

The great success of the St. Louis Manual Training School and other schools established during the same period caused the establishment of similar schools in other places. For sometime all the schools were patterned after the first of its kind, the St. Louis Manual Training School. Later, due to experiences, local conditions and changing ideas, variations of the original type of manual-training school began to appear. Such cities as Chicago, Baltimore, Philadelphia, and Toledo

were establishing manual-training schools similar to the original type of school with some minor modifications.

During the time of the development of the system of "industrials" at the Kansas State Agricultural College and while Professor Woodward was discovering the value of tool exercises as a rapid means of teaching the mechanical arts, the people of Boston were demanding that the public schools of that city give more practical instruction. Because of this more practical instruction, some of the leaders started an experiment which later led to the establishment of manual training in the public elementary schools.

A school known as the Whittling School was opened in the chapel of the Hollis Street Church in 1871. This school, under the direction of Frank Rowell, a photographer, was opened with the purpose of giving the boys some place to spend their leisure hours. A few years later this school united with another industrial school and reopened in a room donated by the city. Professor Channing Whitaker of the Massachusetts Institute of Technology made much preparation for the course which was later referred to by Dr. John D. Runkle as an "excellent example of the Russian method of mechanic-art education." Later in the year a group of men who were promoting this school met and organized the Industrial School Association. The president of the association was Reverend George L. Chaney, and the main topic of discussion was the "importance and feasibility of making manual education a part of public instruction." They believed that the Russian system of "manual education may

be made an efficient part of the public instruction. (4, page 350)

Early Textbooks. In choosing a course of study best suited to supply the public school needs, the association decided on common woodworking, a course in the use of common woodworking hand tools. This committee believed that in order to make the course more effective that they should have a printed textbook. With this belief a committee was appointed with William R. Ware, professor of architecture at the Institute of Technology, as chairman. The resulting book was called Woodworking Tools: How to Use Them and was copyrighted and published by the committee in 1881. Not only was this system of practical education proposed by the committee, it was tested at a school maintained by the Industrial School Association at 23 Church Street and in the school of Mechanic Arts of the Massachusetts Institute of Technology.

Another Industrial school which did much to serve the poor was the North Bennet Street Industrial School. This school was supported by a group of philantrophic women. Mrs. Quincy A. Shaw and Mrs. Augustus Hemenway gave both money and personal attention to the development of this type of industrial work. It was the belief of the management of this institution that the best way to give permanent aid to the poor was to give practical instruction to the children. In the study made of the communities of the neighborhood, it was noticed that the lack of ability for doing many types of work or doing work well was the cause of much of the poverty and crime. With

these views in mind, one can understand why the practical or social motive preceded the strictly educational motive in the elementary as well as secondary schools.

As in Boston, likewise in New York, the introduction of manual training was due to the work done by church missions and philantrophic institutions. In New York two separate lines of industrial-education were started. The first was the "Kitchen Garden" work of Emily Huntington, which eventually became the Teachers College of Columbia University. The second was the first free kindergarten in America, which soon became known as the Workingman's School.

The Industrial Education Association was organized in 1884. This new organization brought men as well as women into the work. The president of the College of the City of New York, General Alexander S. Webb, was elected president of the association.

In the second annual report an explanation of the intended meaning of the word "industrial" which was used in the name of the association was given. It referred to a type of industrial training which was neither technical or professional. It was this type of training that would make better citizens out of boys and girls no matter what life work they followed. It was the greatest objective of the association to promote industrial training in schools of all grades.

A few years later a course of study was adopted, and in 1888 the "Manual-Training Course of Study and Teachers Manual"

was published. In this course, shopwork was outlined beginning with the knife work in the lowest grade. The second year made use of sawing exercises; the third year gave attention to the use of the gouge; the fourth year was spent working with joints of various types and the fifty year was spent in making a box with dovetail joints.

Due to the influence of Dr. Adler, the chief purpose of the society soon became that of ethical training of the children. This new philosophy was that industrial work should be an organic part of the whole. Adler believed in the education of the hand and that public education should be given with the aim of education for the poor.

Movements in Massachusetts. During the summer of 1882 Professor John M. Ordway of the Massachusetts Institute of Technology visited Sweden. While in Sweden, Ordway visited a sloyd shop in the public schools of Stockholm and also visited with August Abrahamson, the founder of the school at Naas, and Otto Salomon, who was at this time teaching a summer class of teachers.

A few years later the real influence of Swedish sloyd upon manual training started with the arrival of Gustaf Larsson who came to Boston in 1888. Larsson was followed shortly by Charles A. Junou and Josef Sandbery. All of these men had studied either under Otto Salomon or in the Naas system. While Larsson did not do anything directly about evolving a course for the elementary schools, it was very largely his

ideas which caused Frank M. Leavitt and Benjamin F. Eddy to do work along this line.

Not long afterwards progressive teachers and supervisors began to introduce manual training in the grammar grades, initiating many new courses along the line of arts in industry. This movement came with the desire to produce or emphasize the art side of the regular manual training course. The last of the movements of manual training in the elementary schools was that of the Industrial Arts. In order to understand the meaning of the term "industrial arts" and its significance, one must recall a brief history to the developments of handwork up to this date. Industrial arts is the term applied in most American Schools today. Of much influence was the philosophy of John Dewey and his book School and Society "placing industrial occupations at the very center of the elementary school curriculum." (4, page 451)

Professor Charles R. Richards, in discussing the application of Dewey's philosophy to manual education of the primary grades, pointed out that school life should be more real and should be an actual reflection of real life outside of the schools walls.

About four years later, in an editorial in a manual training magazine, Richards suggested that the term "industrial arts" be substituted for the term "manual training." His thinking was that due to the change of viewpoint of many educators the purely disciplinary thought of manual training being replaced by the elements of the industries fundamental to

modern civilization.

The Beginning of Modern Concepts of Industrial Arts. In 1910, Frederick G. Bonser, professor of education at Teacher's College, Columbia University, thought that industrial arts as a phase of the elementary school was both a method and a subject. In the discussion of methods of procedure in teaching, Bonser said, "The experiences of the race which have been and are fundamental to the race, constitute the subject matter and content of education." (4, page 455) Bonser believed that re-living these experiences and meeting them in a problem like situation was the best method of teaching.

Later Developments. In 1888 New York College for the Training of Teachers launched a program which was soon to be emulated in various parts of the country. The legislature of the state of Kansas took a forward step in 1903 by establishing a school for the training of special teachers of practical arts subjects. "In 1910, a course in "methods" was announced for teachers and advanced normal pupils preparing to teach manual training." (4, page 479)

In the wake of these pioneer teacher training efforts came the establishment of private institutions such as Blake-Manual Training School, Santa Barbara, California; Stout Institute, Menomonie, Wisconsin; and Bradley Polytechnic Institute, Peoria, Illinois, which did notable work in the field of teacher development.

During the early part of the twentieth century John Dewey

advanced a philosophy which contended:

> A large part of the educational waste comes from the attempt to build a superstructure of knowledge without a solid foundation in the child's relation to his social environment. In the language of correlation, it is not science, or history, or geography that is the center, but the group of social activities growing out of home relations. (4, page 489)

This new philosophy broadened the areas of industrial arts training and put in motion a trend which eventually brought about the specialized vocational training subsidized by the Federal Vocational Education Art of 1917.

Social and Economic Developments. The ever broading philosophy of industrial arts education in the United States can be traced to several specific causes. Among these are: the industrial demands which were an outgrowth of the expansion of mechanized forms of industry; the trend toward urban living which was caused by the modern facilities and employment opportunities which required school attendance of all classes, thus increasing the need for a type of education which would appeal to those who would eventually fill the ranks of industry.

At the time of its inception as a part of the public school curriculum, the inclusion of any type of industrial training in the course of study was a much questioned and very temporary measure. If it were to become a lasting segment of the school program, it must prove itself. To those who originally conceived the idea of a manual type of education, the present day status of industrial arts in the school

curriculum would certainly be very gratifying. The currently existing philosophies, which are outgrowth of the developments in the past, are given in Part B of this chapter.

PART B.

CURRENT PHILOSOPHIES

The ever extending scope of industrial arts education has not caused the birth of new philosophies, but has necessitated that the older philosophies be broadened. This continuously evolving philosophy has come to be almost synonymous with the current philosophy of general education.

Philosophy of General Education. The philosophy of general education as stated by the National Association of Secondary-School Principals includes:

1. All youth need to develop salable skills.
2. All youth need to develop and maintain good health and physical fitness.
3. All youth need to understand the rights and duties of the citizen of a democratic society.
4. All youth need to understand the significance of the family for the individual and society.
5. All youth need to know how to purchase and use good and services intelligently.
6. All youth need to understand the influence of science on nature.
7. All youth need an appreciation of literature, art, music, and nature.
8. All youth need to be able to use their leisure time well and to budget it wisely.
9. All youth need to develop respect for other persons.
10. All youth need to grow in their ability to think rationally. (23, page 10)

The principles included in the ten fundamental needs just quoted bear a very close relationship to the "Important Objectives of Industrial Arts" as recommended by Wilber. (32, pages 42-43) These objectives are:

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

Definition of Terms. The inclusion of definitions of several terms used in this study should prove helpful. These definitions, quoted from various sources in this field of study, have been selected because they agree with the educational philosophy just proposed.

> Education is the preparation "which fits the whole man for his grand vocation as a member of society and a citizen of the world, plans must be laid for vigorous coeducation of mind and body as an inseparable unity in every stage of their development." (19, pages 24-27)

> Industrial Arts is a phase of general education designed to develop certain habits, attitudes, and abilities desirable for all citizens of an industrial world regardless of their vocations. (22, page 571)

> Industrial Education is a generic term including all educational activities concerned with modern industry and crafts, their raw materials, products, machines, personnel, and problems. It therefore includes both industrial arts and vocational industrial education. (14, page 7)

> Manual Arts is one of the earlier terms used to identify shopwork involving design and hand concentration in various mediums with the purpose of developing art appreciation and manual skill. (15, page 32)

> Manual Training is an earlier type of school shop activity usually restricted to fixed exercises in the woodwork, metalwork, and mechanical drawing; strong emphasis was placed on tool exercises and manual skill; gave way first to manual arts and later to industrial arts. (15, page 32)

> Mechanic Arts is (1) a type of school work (predominate during the later part of the nineteenth century) designed to teach the trades and related science; (2) a substitute for apprenticeship, taken in school while studying mathematics, science, and engineering. (15, page 32)

> Vocational Education is concerned about the whole of life and places emphasis upon the adjustment of the individual to both the economic and social world and the preparation of the individual for successful participation therein. (20, page 39)

The Objectives of Industrial Art Education. The aims of industrial art education are many and varied because of the great diversity in grade levels, types of pupil, and community interests which are involved. Newkirk and Johnson have summarized the teaching objectives as:

> 1. Develop the ability to plan and complete projects, using a variety of tools and construction materials in a workmanlike manner.
> 2. Give experiences that will increase understanding of modern industry and that will lay the foundation for and help determine vocational interests.
> 3. Develop the ability to read and make working drawings.
> 4. Develop the ability to recognize quality and design in the products of industry.
> 5. Develop the ability to maintain and service in a safe efficient manner the common products of industry.
> 6. Provide an objective medium for expression in mathematics, science, language, arts and social sciences.
> 7. Develop the interest in crafts as a valuable medium for creative expression in leisure time.

8. Give experiences that will develop social understanding and the ability to work effectively with others either as a leader or as a member of the group. (25, pages 270-272)

These objectives, if expanded, would be much the same as the "Objectives for Industrial Arts in Oklahoma Schools" which were formulated by the policies committee of the State Advisory Committee for Industrial Arts in Oklahoma Schools, June 4, 1950:

1. Contributes to consumer education.
2. Develops avocational interests.
3. Aids vocational choices.
4. Develops handy man or home mechanics abilities.
5. Imparts industrial information.
6. Trains in industrial and home safety.
7. Guides in industrial design.
8. Instills and appreciation of applied skills.
9. Develops satisfaction in personal creative achievement.
10. Stimulates interest in a specific field of industrial occupation and develops a personal interest in successful achievement.
11. Provides a knowledge of industrial drawing, the language of industry.
12. Trains to analyze a job into its correct tool processes and to organize them into an efficient procedural order.
13. Recognizes the standards of industrial attainment.
14. Trains in good "housekeeping" of shop-keeping.
15. Develops appreciation of the value of industrial materials or contributes to the conservation of materials and resources.
16. Contributes definitely to later vocational efficiency.
17. Offers opportunity to apply knowledges learned in other school subjects in the completion of industrial arts project.
18. Complements other school subjects in contributing to a general education.

The philosophy of the leaders of industrial arts education of the present decade has naturally influenced the content of this paper immeasureably. In Part C of this chapter, a

preposed controlling philosophy, based upon the framework of industrial arts philosophy currently accepted, is given.

PART C.

A PROPOSED CONTROLLING PHILOSOPHY OF INDUSTRIAL ARTS

The following statements are proposed as a reasonable and current controlling philosophy of industrial arts in Oklahoma schools. Industrial arts offers to every youth an opportunity to explore the world in which he lives. Industrial arts courses offer an unusual number of opportunities for "learning" as is advocated in the "learn by doing" philosophy of John Dewey. Industrial arts is not something apart from, but is a phase of general education. The broadness of the field allows many opportunities for vocational exploration. From such courses can come "ways and means" for using leisure time.

This philosophy is in accord with that of Newkirk, who says,

> The general shop teacher needs the same culture and refinement that is demanded of other teachers in the school system. Nothing will add more to the success of the general shop and the industrial arts work as a whole than teachers with a thorough grounding in the arts and sciences. Culture is difficult to define; it is a way of life rather than the mere possession of a mass of knowledge. There is no reason why the general shop teacher should not be able to speak and write correct English and have some appreciation for literature in general. Casual inspection of the content presented in the general shop shows the necessity of mathematics, physics, and chemistry. The social sciences are especially valuable as a foundation for an adequate understanding of modern industry and an appreciation of the economic environment in which we live. (24, page 21)

Accepted Definitions. In order to add to the understanding of this study the terms defined in Chapter II, with definitions from a different source are included here. These definitions are included for the purpose of simplifying previous definitions.

> Industrial Education comprises two major areas--industrial arts and Vocational-industrial education. Since both areas deal with the materials and processes of industry, they together bear the name industrial education. They differ, however, in purpose and to some degree, in method, and they deal with distinctly different groups of pupils or with the same pupils at different stages of learning. (22, page 571)

> Industrial Arts is a study of the processes, tools, and machines by means of which the forces of nature are utilized and the raw materials of nature are changed by man to make them more valuable and pleasing. It includes an understanding of the native qualities of raw materials and of the natural forces, together with a knowledge of the methods and practices of utilizing and changing these materials and forces. It is also concerned with the social and economic problems incident to these changes. (29, page 1)

> Vocational-industrial Education is a phase of specific vocational education, designed to train prospective and employed workers for proficiency in industrial vocations. (22, page 571)

Conclusion. This proposed philosophy of industrial arts is in accord with the prevailing accepted philosophies of the leaders in the field. Industrial arts is a phase of general education; it contributes more than other phases of the school program, which most educators deem so essential.

The industrial arts shop has for many years been looked upon by teachers of the so-called academic subjects as a place where students who could not "pass" should be sent to do their school work. In the past there was some justification

in this thinking because "industrial arts" was simply "manual training" under a new title. Through the proper use of an industrial arts classroom library, shop work could be supplemented with much related information. In this way the concept of industrial arts would soon be corrected.

Much time has been spent with the help of many authorities in the field, comparing and rating texts and reference books in the areas commonly taught in industrial arts in Oklahoma. The result of these conferences was the basis for the annotated bibliography suggested for use in the industrial arts library which is presented in Chapter IV.

CHAPTER III.

THE STUDY IN DETAIL

The challenge of the ever increasing number of supplementary textbooks and reference books, being published in the industrial arts field is somewhat confusing to the teacher who must select books for the department library, but just is not quite sure what books should be purchased. This study is an effort directed toward making this problem an easier one for the average industrial arts teacher to solve.

PART A.

DETAILED REPORT OF TECHNIQUES INVOLVED

In the beginning of this study, a survey was made of all the courses offered in the field of industrial arts education in the state of Oklahoma. When the survey was complete, fourteen fields were chosen as the basis for this study because they involved the most frequently offered courses and were the most easily adaptable to the purpose of the industrial arts program in the public schools of the state. To these fields was added a sixteenth area which concerned professional books.

Survey of Publisher's Catalogs and Bibliographies. The first step involved the finding of all available textbooks and reference books. This was done by examining the catalogs issued by all the companies specializing in the field

of industrial arts books and by the majority of companies which publish only a few textbooks or reference books in this field. (See Appendix -- for a list of publishers catalogs studied) A check of the bibliographies of the currently published books revealed book titles which had not been listed in the other sources checked. Only those books which concerned junior high, high school and early college levels were chosen. No technical books were included. In order to assemble this material in a logical usable order a card catalog was made on three by five inch cards. These were then arranged under the field of study which they concerned.

Next an appointment was made for a personal conference with an experienced teacher in each area of study. At the time of the first conference, each book listed was considered and all those deemed worth further study were checked. At the second conference the books considered were actually examined by the writer and the instructor. At this time they were rated by the rating sheet included in Part B of this chapter.

For some industrial arts subjects thirty books were selected while in others approximately fifteen were chosen. This was done in accord with a suggestion made by Gordon Wilber:

> It is suggested that comprehensive general shop should have at least ten books in each of the areas represented. These should be both project books and those of an informational nature. A unit shop should have a minimum of thirty-five books in the area covered by the

> activity. A limited general shop, such as a general metal shop should have at least thirty-five books well distributed over the various fields. (32, pages 188-189)

Wilber suggest only ten books in some of the shop subjects which are not offered as often as others, but fifteen books have been included in this report because it seemed desirable to have at least that number of books available for one in these industrial arts subjects.

Book Examiners and Evaluators. The teachers in special fields were selected for this study from among the summer faculty in industrial arts education courses at Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma.

Those selected to rate and evaluate the books include:

Bainum, Cliff K. . . . . Welding
Barnes, E. M. . . . . Electrical Work
Bengtson, Leroy H. . . . . Machine Woodworking
Bengtson, Leroy H. . . . . Industrial Finishes
Hill, Carey L . . . . . .Mechanical Drawing
Hunt, Dewitt. . . . . Carpentry
Hunt, Dewitt. . . . . Art Copper Work
Hunt, Dewitt. . . . . .Bench Metal Work
Hunt, Dewitt. . . . . Forging
Hunt, Dewitt. . . . . .Home Mechanics
Hunt, Dewitt. . . . . .Graphic Arts
Hunt, Dewitt. . . . . .Sheet Metal Work
Hunt, Dewitt. . . . . .Professional Books
Kirk, Myrl S. . . . . Leatherwork
Tate, John B. . . . . .Hand Woodworking
Tate, John B. . . . . .Plastics

List of Publishers. The publishing companies which had books considered in the survey include:

A. M. Byers Company, Pittsburg, Pennsylvania.
American Book Company, New York, New York.
American Foundrymen's, Chicago, Illinois.
American Handcrafts Company, Los Angeles, California.
American Technical Society, Chicago, Illinois.

Beacon Press, Boston, Massachusetts.
Bridgman Publishers, Pelham, New York.
Bruce Publishing Company, Milwaukee, Wisconsin.
Bureau of Publications, Teachers College, Columbia University, New York, New York.
Charles A. Bennett, Company, Inc., Peoria, Illinois (formerly the Manual Arts Press).
Charles Scribner's Sons, New York, New York.
Chemical Publishing Company, Inc., Brooklyn, New York.
Colorado Springs Publishing Company, Colorado Springs, Colorado.
Commercial Engraving Publishing Company, Indianapolis, Indiana.
D. Appleton--Century Company, New York, New York.
Davis Press, Inc., Worchester, Massachusetts.
D. C. Heath and Company, Dallas, Texas.
Delmar Publishing Company, Albany, New York.
Dodd, Mead and Company, New York, New York.
D. Van Nostrand Company, Inc., New York, New York.
Franklin Watts, Inc., New York, New York.
Frederick J. Drake and Company, Chicago, Illinois.
Ginn and Company, New York, New York.
Hamilton Company, New York, New York.
Harlow Publishing Company, Oklahoma City, Oklahoma.
Harper and Brothers, New York, New York.
Harvard University Press, Cambridge, Massachusetts.
Inland Printers, Chicago, Illinois.
International Textbook Company, Scranton, Pennsylvania.
James W. Loop, Charleston, West Virginia.
John Crowthers Publication,
John Wiley and Sons, New York, New York.
Kit Kraft, Los Angeles, California.
Leisure Craft, Los Angeles, California.
Lincoln Electric Company, Cleveland, Ohio.
Lippincott Company, Philadelphia, Pennsylvania.
MacMillan Company, New York, New York.
McCormick--Mathers, Company, Wichita, Kansas.
McGraw--Hill Publishing Company, New York, New York.
McKnight and McKnight Publishing Company, Bloomington, Illinois.
Manual Arts Press, Peoria, Illinois. (Now the Charles A. Bennett Publishing Company).
Metal Crafts Publishing Company, Providence, Rhode Island.
Murray and Gee, Inc., Hollywood, California.
Ohio State University Press, Columbus, Ohio.
Out West Printing and Stationary Company, Colorado Springs, Colorado.
Pitman Publishers Corporation, New York, New York.
Portland Cement Company Association, Chicago, Illinois
Prentice--Hall, Inc., New York, New York.
Scott Foresman, Chicago, Illinois.
South Bend Lathe Works, South Bend, Indiana.
Stanford University Press, Stanford, California.
Struck Company, Austin, Texas.
Studio Publications, New York, New York.

United Typothetae of America, Chicago, Illinois.
University of Chicago Press, Chicago, Illinois.
U. S. Bureau of Education, Industrial Education Circular No. 15.
W. E. Rudge's Sons, New York, New York.

PART B.

DISCUSSION OF TECHNIQUES FOR RATING INDUSTRIAL ARTS BOOKS

There are some very important factors which should be considered in making actual book choices. In this connection, Francis K. W. Drury makes the following statements:

> The high purpose of book selection is to provide the right book for the right reader at the right time. A wise selection is confirmed by usefulness, either now or in the future. (9, page 1)

> The importance of wise selection can scarcely be overestimated. Since, therefore, we do not desire our libraries to be collections of worthwhile but unused books of the one hand nor worthless but widely read books on the other, selection for purposeful efficiency is absolutely essential.
>
> It is apparent that book selection for a library involves three primary factors: The books themselves, the public which will use them, and the resources of the library. (9, pages 1-4)

This study is concerned with only one of these three factors, the books themselves. A rating scale entitled "A Guide for Rating Industrial Arts Books," is included on page 7 of this chapter. In order that each phase of this scale may be clear an interpretation of the factors involved is given in the following paragraph.

Reliability and Competence of Author. To determine the status of an author several things must be considered.

(1) "Educational background." What type of formal education does the author have? When and where was this education acquired? (2) "Experience." Previous work as a writer. What type of material or books has the author written? (3) "Work-experience background." It is possible that the author could be well established in one field of study and write in another field. This is important because some authors use their established names as co-authors of other books. (4) "Philosophy." The writer must have a philosophy in accord with that of a democratic program of education. (5) "Related experience." Not only does the author need an exclusive knowledge of the immediate field, but a general knowledge of related fields.

Up-to-dateness of the Book. The type of books and the subject discussed will have important bearing on the up-to-dateness of the book. In a well established field, books do not become out-dated as quickly as in those new and continually growing fields. A great deal of emphasis can be placed upon the copyright date or last revision date. Allowance must be given, however, to older books which still cover the field as it is today.

Reputation of Publisher. The reputation of the publisher depends on the services received by the readers as well as the type of book which is published. The authors of books do much to establish the reputation of the publisher, therefore a publisher must at all times choose with caution the authors whose works will be published.

GUIDE FOR RATING INDUSTRIAL ARTS BOOKS

1. Reliability and Competence of Author
2. Up-to-dateness
3. Reputation of Publisher
4. Physical Make-up of the Book
5. Cost
6. Indexes
7. Bibliography
8. Table of Contents
9. Appendixes
10. Size (too large or too small)
11. Completeness

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

The rating of the book included in the selected bibliography is indicated by letters having specific values.

A -- Excellent

B -- Good

C -- Fair

D -- None or inferior

Physical Make-up of Book. (1) "Binding." The book should be well bound, of substantial materials which will give lasting service. Paper back books, stapled booklets, etc., are not usually worth the money spent or the effort required to keep them on the shelves. Spiral binding allows the book to be opened flat and is very desirable in many types of books. (2) "Paper." The paper should be of good quality, of the proper texture so that glare will not harm the reader's eyes and of a type to increase the speed of reading without tiring results. (3) "Print." The print should have distinctive character and be large enough to allow reading with ease. (4) "Illustrations." Good illustrations add a great deal to the importance of a book. They supplement the printed material and make the book more interesting. (5) "Diagrams and Photographs." Much information which would take pages to explain can be shown in one photograph or diagram. Good photography and well-made diagrams can do a great deal to enhance the written material.

Cost. To judge the value of a book is very difficult. Indirectly this would envalue every phrase of book selection but some books are too cheap or too expensive for the school library. A book is too cheap regardless of how low the cost if it will not "stand up" under circulation. On the other hand a book is too expensive if its purchase prohibits the purchase of several other books which could have served the intended purpose just as well.

Indexes. The value of the book will be determined by its

usefulness. To be useful a book must be organized in such a way that the information needed can be found quickly with the least effort on the part of the user. An index is really one of the several keys which unlock the treasures of a book. Certain types of books, especially reference books, loose much of their value if they do not have adequate indexes.

Bibliography. A bibliography may be used to validate the quotations made by the author and to give the user of the book a knowledge of the author's background. A bibliography can also be used as a guide for further study by the user.

Table of Contents. This enables the reader to review quickly the content or structure of a chapter or book. It is a very important and necessary part of a well written book. The table of contents is especially helpful in a book which deals with chronological arrangement.

Appendixes. The material added to a book but not essential to its completeness, usually called an appendix may include, bibliographies, notes, or tabulated matter. An appendix is very important to the user of the book, especially if it is highly technical in nature.

Size. The size of the book is important to both the reader and librarian. A book can be too large or too small for proper shelving. Readers like books which are easy to handle and will often hesitate to check out a book which is either abnormally large or small.

Completeness. The purpose for which the book is intended

and how well it adapts itself to the intended use constitute its "completeness." A book is complete if it covers the area for which it is selected.

The purpose of this chapter has been to give a detailed analysis of this study. The following chapter includes a bibliography of textbooks and reference books selected and rated in accord with the "Guide for Rating Industrial Arts Books" included in this chapter.

CHAPTER IV.

A SELECTED BIBLIOGRAPHY OF INDUSTRIAL ARTS BOOKS

The purpose of this chapter is to give usable and valuable material to teachers who are concerned with building industrial arts libraries. Assistance in library selection is provided by selecting and rating a number of textbooks and reference books in each of the subject matter areas most commonly included in the industrial arts program.

The majority of the books are rated in accordance with the rating sheet discussed in Chapter III. Those not rated were not available to those doing the rating, but were included because they are known by the raters and were thought valuable enough to warrant their inclusion in the proposed bibliography. The books listed in the bibliography and marked with an asterisk were actually examined by the raters and are classified as the best books in their particular field.

Each industrial arts subject area included in this study will be introduced and discussed as to the grade level, importance in the field, and number of times offered in Oklahoma. The introductory paragraphs immediately precede the selected bibliography of that particular subject matter field.

An additional bibliography of professional books is included. These books have a very high rating and were chosen as basic by the rater of that particular area as being valuable. These books could make a great contribution to the

professional growth of the teachers of industrial arts and their administrators.

ART COPPER WORK

The importance of copper in everyday living is partially revealed by the fact that it is one of the world's oldest metals. "Copper is one of six metals mentioned in the Old Testament and the most important of the seven mentioned by ancient historians," Arthur F. Payne wrote in Art Metal-work With Inexpensive Equipment, (27, page 14) Surely a metal which has held such an important place among other metals from the beginning of time and which is still being used extensively in many present day industrial applications is indispensable in a well planned industrial arts program.

Grade Level. The versatility of copper in work situations and its fascinating appeal to the workman regardless of age places copper on all grade levels of industrial arts program.

Importance. The use of art copper enables the pupil to develop to the fullest his artistic abilities. Copper is known as the "friendly metal". It is a metal which intuitively holds the interest of those who work with it. From an avocational interest standpoint, copper ranks high as a material for the home craftsman. The machines and tools used in working copper are inexpensive which is another factor making this a desirable material to be used by the hobbyist. Recently, aluminum and pewter have become popular in this phase of industrial arts, because they are easy materials to work, attractive, and inexpensive.

Offered in Oklahoma. Art copper as a named course in

industrial arts in Oklahoma is possibly offered in less than a half dozen schools, but it is quite generally known that a number of general metal courses have certain units in which extensive copper work is done.

A SELECTED BIBLIOGRAPHY

1.* Bick, A. F., Artistic Metalwork, The Bruce Publishing Company, Milwaukee, Wisconsin, 1940, 236 pages, $3.00.

Designed for school shops with very limited equipment, this book provides complete instructions for metalworking, as well as projects that are both artistic and inexpensive.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

2.* Feirer, John L., Modern Metalcraft, The Manual Arts Press, Peoria, Illinois, 1946, 288 pages, $3.50.

Thirty-three attractive new projects in metal, sure to appeal to the instructor and student alike. Also a complete treatment of processes in art metalwork. Ideal illustrations include photographs of finished articles.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	B	B	D	A	A

3.* Hobbs, Douglass B., Working with Aluminum, The Bruce Publishing Company, Milwaukee, Wisconsin, 1938, 126 pages, $2.50.

Contains twenty-five useful projects involving basic metalworking processes which can be made in the school or home workshop and includes all sorts of interesting articles. Each project is illustrated.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	A	D	A	A

4. Johnson, Robert V., 32 Metal Spinning Design, The Bruce Publishing Company, Milwaukee, Wisconsin, 1948, 102 pages, $1.75.

Complete instructions in the fundamental processes of metal spinning, with thirty-two artistic and beautiful projects selected for their simplicity and student interest are here presented for the beginner as well as for others.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5.* Knonquist, Emil F., Metalcraft and Jewelry, The Manual Arts Press, Peoria, Illinois, 1942, 199 pages, $3.00.

Very popular, famous for the fine artistic quality of the projects and the direct, simple step-by-step procedures. Prepared by the conductor of one of the most interesting community craft centers in the United States.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	D	B	D	A	A

6.* Ludwig, Oswald A., Metalwork Technology and Practice, McKnight and McKnight, Bloomington, Illinois, 1943, 400 pages, $4.00.

A complete text book for metal-work, hand and machine. It presents usable information for machine shop, automotive, aeronautical, metal pattern working, foundry, sheet metal, ornamental metal, metal building, and allied trades.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	D	A	D	A	A

7.* Lukowitz, Joseph J., Interesting Art Metal Work, Bruce Publishing Company, Milwaukee, Wisconsin, 1938, 63 pages, $.50.

This book has complete, simplified directions for making thirty useful, artistic, inexpensive articles in cold metal work. Only the simplest tools processes and commonest tools are involved.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

8.* Martin, Charles, and D'amico, Victor, How to Make Modern Jewelry, International Textbook Company, Scranton, Illinois, 1949, 96 pages, $2.50.

This book discusses and describes the making of necklaces, rings, bracelets, earrings, and other jewelry by simple hand-methods, such as using wire and metal strips. It also covers stone setting. Eighteen graded projects are presented.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

9.* Miller, John G., Metal Art Crafts, D. Van Nostrand Company, Inc., 1948, 165 pages, $2.20.

Part I of this book is devoted to operations and precedures. Part II is made up of projects representative of each operation described in Part I, and graded from easy to hard. Anyone who can read can follow the explanations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	A	A	A	A	A	A	B

10. Pack, Greta, Jewelry and Enameling, D. Van Nostrand Company, Inc., 1943, 171 pages, $2.80.

This book gives very little instructional material, it concentrates on operations. It combines the step-by-step simplicity of a work manual with the information of a technical book and the result is a text that is thorough.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

11.* Payne, Arthur F., Art Metal Work With Inexpensive Equipment, The Manual Arts Press, Peoria, Illinois, 1929, 176 pages, $3.50.

This book contains information on metals, alloys, and coloring, and finishing work. Many designs and projects are suggested; unusually practical and stimulating organization of subject matter. Only simple equipment is needed.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	B	D	A	D	A	A

12.* Reagan, James E., Metal Spinning Projects, The Bruce Publishing Company, Milwaukee, Wisconsin, 1936, 80 pages, $1.25.

This book includes designs which are not only beautiful but enjoyable to make and use as well. Very simple in appeal, the patterns are modernistic, involving subtle curves. The projects are varied to suit the taste, age, and experience.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	B	D	B	D	A	C

13. Rose, Augustus F., Copper Work, Metal Crafts Publishing Company, Providence, Rhode Island, 1931, 192 pages, $3.50.

This book is suitable for an introductory course in art copper for junior high school, senior high school, and occupational theragpy work. It includes designs to serve as guides.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

14. Wiener, Louis, Hand Made Jewelry, D. Van Nostrand Company Inc., 1948, 210 pages, $2.20.

This is a book of techniques. It gives in fine detail the basic methods of (1) enriching a metallic surface, and (2) manipulating its form and contour. It is not a project book. This is a beginners book.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

BENCH METAL WORK

Bench metal work is commonly done with hand tools. It includes such a variety of operations that almost all kinds of metals can be used at sometime. In the school shop the metals most commonly used are mild-steel bars, light weight sheet metal, copper, brass, aluminum, and various castings.

Grade Level. This type of metal work offers such a wide range of experiences that courses can be worked out on all grade levels. Precautions should be taken, however, not to include in the lower grades the dangerous operations of working hot metals and casting.

Importance. One of the leading industries of the world, metalworking includes a great many trades. For this reason, it is important that pupils know about these trades and the products which are produced. In addition to this knowledge, many skills which will be useful in home life are acquired in metal work classes.

Offered in Oklahoma. Twenty schools are listed in the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities School Session, 1949-50 as teaching some type of metal work as a named course is not listed. It is generally known that a metal work course may include a variety of units, of which bench metal work is one.

A SELECTED BIBLIOGRAPHY

1.* Ashcroff, Cyril C., and Easton, J. A. G., General Shop Work, Macmillan Publishing Company, New York, New York, 1940, 239 pages, $2.00.

A manual for pupils engaged in shopwork in junior high and senior high school. This text is built around the general shop and includes many subject matter areas.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	A	D	A	A

2. Aston, James, and Story, Edward B., Wrought Iron, A. M. Byers Company, Pittsburg, Pennsylvania, 1936, 59 pages, $1.00.

This book discusses the manufacturing of iron; its charistics and applications. Contains a history in the art of manufacturing of iron.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

3. Becker, William J., Metalworking Made Easy, The Bruce Publishing Company, Milwaukee, Wisconsin, 1943, 135 pages, $1.60.

An excellent group of simple metalworking projects for the beginner, emphasizing fundamentals--sheet metal, art metal, and ornamental iron. Projects are arranged according to difficulty.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

4.* Berg, E., and Wing, B. E., Essentials of Metalworking, The Manual Arts Press, Peoria, Illinois, 1927, 159 pages, $1.32.

A beginning text for benchwork in cold metals, covering basic tool processes and giving related information pertaining to production, characteristics, and manipulation of common metals.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	B	D	A	A

5.* Bollinger, J. W., Elementary Wrought Iron Work, Bruce Publishing Company, Milwaukee, Wisconsin, 1930, 139 pages, $1.32.

Contains simple explanations of the properties of iron and steel, descriptions and illustrations, a carefully graded series of 68 interesting projects for junior high school use.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	B	B	D	A	A

6.* Dragoo, A. W., and Dragoo, K. L., General Shop Metal Work, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1936, 70 pages, $.60.

Short teaching units cover work in beginning bench metal, sheet metal, art metal, and ornamental metal. Includes designs and directions for 28 projects of a practical, usable nature.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	B	B	D	A	A

7.* Giachino, J. W., and Feirer, John L., Basic Bench Metal Practice, The Manual Arts Press, Peoria, Illinois, 1943, 160 pages, $2.96.

Planned in complete detail to meet all requirements of the modern school shop. Packed with brilliant instruction photographs and other unusually attractive and informative illustrations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	C	B	D	A	A

8.* Googerty, Thomas, Decorative Wrought Iron Work, The Manual Arts Press, Peoria, Illinois, 1937, 79 pages, $1.00.

Contains working drawings and working notes on the making of simple, useful articles from wrought iron, brass, and copper.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	D	A	A	B	B	B	A	D	A	A

9.* Grayshon, Alfred B., General Metal Work, D. Van Nostrand Company, Inc., New York, New York, 1930, 278 pages, $3.00.

A beginning course in sheet metal and machine shop work, appealing to all groups of students. Projects are interesting and broad enough for all tastes and abilities.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	C	B	D	A	A

10.* Groneman, D. H., Bent Tubular Furniture, The Bruce Publishing Company, 1941, 120 pages, $2.00.

A manual of simple directions and clear illustrations for fashioning steel tubing into 51 attractive, useful, inexpensive pieces of furniture of modernistic design.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	B	B	D	B	D	A	C

11.* Haines, Adams, Van Tassel, and Thompson, Metalworking, D. Van Nostrand Company, Inc., New York, New York, 1945, 148 pages, $1.28.

This book describes the common metals and their uses, the common hand metalworking tools, maintenance of the engine lathe, and directions in making projects of metal.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

12. Hobbs, Douglas B., Alluminum: Its History, Metallurgy, and Use, With Projects for the School and Home Shop, The Bruce Publishing Company, Milwaukee, Wisconsin, 1938, 304 pages, $3.50.

Combining the theory of aluminum metallurgy and metalworking with practical, workable, and useful projects, this presentation enables the student to obtain background data while working with a metal.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

13. Hobbs, Douglass B., Working with Aluminum, The Bruce Publishing Company, Milwaukee, Wisconsin, 1947, 126 pages, $2.50.

Contains 25 useful projects which involve such basic metal working processes as sawing, bending, forming, casting and spinning. Projects are arranged to develop skills as progress is made.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

14.* Jones, H. A., Metal Work, The Bruce Publishing Company, Milwaukee, Wisconsin, 1933, 112 pages, $1.00.

This book discusses general metalwork, and contains simple projects to be made out of metal. For junior high and senior high schools. Well illustrated.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	B	D	A	A

15.* Krom, Edward F., and Paige, Peter J., Hand-Wrought Ironwork, The Bruce Publishing Company, Milwaukee, Wisconsin, 1946, 112 pages, $2.50.

Fifty wrought iron projects including a variety of articles. Excellent designs within the ability range of elementary and high school students. Detailed information.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

16.* Osburn, E. N., and Wilber, G. O., Pewter Spun, Wrought and Cast, International Textbook Company, Scranton, Pennsylvania, 1937, 234 pages, $.75.

An excellent basic textbook for any course in art metal work because it deals with processes and operations which are applicable to metals other than pewter.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	B	B	A	A

17. Peterson, L. C., 101 Metal-Working Projects, The Bruce Publishing Company, Milwaukee, Wisconsin, 1920, 214 pages, $2.75.

Each project includes a complete working drawing, explanation of the nature and uses of the completed article, description of the tools, equipment, and material required, and detailed directions.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

18.* Selvedge, R. W., and Alton, J. M., Blacksmithing, The Manual Arts Press, Peoria, Illinois, 1925, 156 pages, $2.50.

Standard processes in horseshoeing and forge practice applied specifically to the blacksmith trade. Problems demonstrate how to use tools and materials. Drawings are clear and accurate.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	B	B	B	C	B	D	B	B

19.* Smith, Robert E., Units in Bench Metal Work, McCormick-Mathers Publishing Company, Wichita, Kansas, 1939, 48 pages, $.80.

Elementary bench metal work with special emphasis on layouts, correct use of tools, equipment, and safety precautions. Valuable related information on files, bolts, screws, tapes, etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	B	A	B	A	B	B	D

20.* Tustison, F. E., and Kranzusch, R. F., Metal Work Essentials, The Bruce Publishing Company, Milwaukee, Wisconsin, 1936, 176 pages, $1.75.

A basic text for beginning courses in metalwork covering the essential bench processes characteristic of the entire field. Organized in 33 "basic units" of instruction.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	B	D	A	A

CARPENTRY

"Carpentry is the art of working with wood in the construction of buildings in which to live or work." W. H. Durbann, Fundamentals of Carpentry, (11, page 1). This art is thousands of years old. Its early beginning started when man left the caves and started building shelter from sticks and grass. Carpentry today is complex and the carpenter must be well trained in order to succeed.

Grade Level. Carpentry should be offered in the last two years of high school work and on the college level, because the student should be mature, and should have acquired much related information previously. If the course serves as a means of vocational guidance the student should be ready for such guidance.

Importance. Carpentry as an industrial arts course would give the student a general understanding of house construction, type of structure, appreciation of good workmanship, and ability and skills in making minor repairs. For some students it would offer an opportunity to develop vocational interests.

Offered in Oklahoma. According to the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities School Session, 1949-50, which lists courses offered in industrial education in Oklahoma Schools, carpentry as a named course was listed ten times.

A SELECTED BIBLIOGRAPHY

1. Close, Paul D., Building Insulation, American Technical Society, Chicago, Illinois, 1946, 372 pages, $4.50.

   Explains all types of insulating materials. Filled with practical examples worked out in detail. Ideal for schools, for home builders, and for training of salesmen of insulation.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

2. Cooper, George H., Building Construction Estimating, McGraw-Hill Book Company, New York, New York, 1945, 283 pages, $3.00.

   Offers complete treatment and specific handling of the essentials without combersome detail. Includes many specimen estimates, numerous illustrations, questions and exercises.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

3. Durbahn, Walter E., Fundamentals of Carpentry, Vol. I, American Technical Society, Chicago, Illinois, 1948, 336 pages, $3.25.

   Deals with the tools, materials, and practice included in carpentry work. Includes information units, reference materials and a dictionary of carpentry terms.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

4. Durbahn, Walter E., Fundamentals of Carpentry, Vol. II, American Technical Society, Chicago, Illinois, 1948, 444 pages, $4.25.

Deals with the practical construction phases of carpentry. Step-by-step process of constructing a building from the excavating to the finishing. Discussed in the sequence in which the work is done.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5.* Ericson, E. E., and Soles, R. L., Planning Your Home, Manual Arts Press, Peoria, Illinois, 1938, 131 pages, $2.00.

For use in homemaking as well as industrial arts courses. Analyses and illustrates problems of home planning. Architectural drawing is simplified and applied to features of home planning.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

6.* Griffith, Ira S., and Cox, George D., Carpentry, Charles A. Bennett Company, Inc., Peoria, Illinois, 1935, 188 pages, $2.00.

The building of a typical house, from the laying of foundations to the completion of the interior finish. Illustrated with photographs taken "on the job".

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	D	A	A	A	A	A	A	A	A	B

7. Lair, Elbert A., Carpentry for the Building Trades, McGraw-Hill Book Company, New York, 1947, 196 pages, $2.40.

Deals with all phases of carpentry work for the building trades. Emphasis is placed on tools and methods needed for the construction of small residences and frame houses.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

8. Roberts, Thomas, and Roberts, Ruth, Accurate Home Estimating, The Bruce Publishing Company, Milwaukee, Wisconsin, 1942, 270 pages, $4.00.

How to estimate building expenses and cost of materials; to draw up building contracts and choose the contractor; to read construction plans and blueprints.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

9.* Townsend, Gilbert, Carpentry, American Technical Society, Chicago, Illinois, 1935, 441 pages, $2.50.

A very popular and easy-to-understand book for carpenters and apprentives, dealing with carpentry and joinery in all its forms, including laying out roofs.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	A	A	A	A	A

10.* Townsend, George, Steel Square, American Technical Society, Chicago, Illinois, 1947, 172 pages, $2.25.

This edition not only gives all of the fundamentals, but includes illustrative problems on all the usual applications from the start to the finish of constructing a house.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	A	A	A	A	A

11. Townsend, George, and Dalzell, R. J., How to Plan a House, American Technical Society, Chicago, Illinois, 1942, 525 pages, $5.00.

The apprentice, building tradesman, builder, architectural student, and the prospective homeowner will find this book full of basic and authoritative information on planning.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

12.* Townsend, Dalzell, McKinney, How to Estimate for the Building Trades, American Technical Society, Chicago, Illinois, 1939, 633 pages, $5.50.

Estimates all material and labor costs for every phase of the building trades as related to residences and moderate size buildings. Includes 8 blueprints drawn to scale.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	A	A	A	A	A

13. Whitman, Roger B., First Aid for the Ailing House, McGraw-Hill Book Company, New York, New York, 1946, 393 pages, $2.75.

Completely revised. Many new pages have been added concerning new methods for keeping a house in first-class condition from the angles of both comfort and operating economy.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

14. Wilson, Douglas J., and Rogers, Clell M., Carpentry Mathematics--New Second Edition, McGraw-Hill Book Company Inc., New York, 1949, $2.20.

Its main objective is to give high school students and carpentry apprentice a working knowledge of mathematics applied to everyday problems covering every phase of the carpenter's job.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

15. Wilson, Douglas J., and Werner, S. O., Simplified Roof Framing--New Second Edition, McGraw-Hill Book Company, New York, New York, 1947, 162 pages, $2.00

This book provides a simplified course, particularly adapted to the needs of beginners. Each chapter deals with basic roof types, its rafters and problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

ELECTRICAL WORK

The field of electricity is so vast that its offering in industrial arts must be limited to the more fundamental and practical phases. To go beyond this would suggest specialized vocational training which is not a part of industrial arts.

Grade Level. Industrial arts deal with electricity from its simplest forms to the higher but still basic forms of radio. In this range many learning situations can be found and utilized in any grade from the junior high school level to college. Instructional units differ on the various levels but the learning situations are similar.

Importance. The importance of electrical work in the industrial arts program lies in helping educate students to understand and appreciate modern electrical appliances and the influence of electricity in their everyday living. "High school courses in electricity can teach the safe use of electrical devices common in modern living." This statement was included by Newkirk in his recent book, The Industrial Arts Program. (25, page 324)

Offered in Oklahoma. The Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities School Session, 1949-50, lists twelve college classes in electricity, and thirteen classes in junior high schools and senior high schools.

A SELECTED BIBLIOGRAPHY

1.* Abbott, Arthur L., National Electrical Code Handbook, McGraw-Hill Book Company, New York, New York, 1947, 633 pages, $4.00.

Gives all Electrical Code requirements, restating involved rules in simple language, plus explanations, practical directions, and diagrams, showing what the rules mean and how to apply them.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

2.* Burling, Burdette B., Preparatory Electricity, The Bruce Publishing Company, Milwaukee, Wisconsin, 1928, 114 pages, $1.28.

Twenty-eight jobs selected to give boys a working knowledge of the fundamental prinicples of electricity and its most common applications to home and industrial uses, arranged in the form of lesson instruction sheets.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	C	B	B	B	C	C	C	B	C

3.* Cook, Sherman R., Electrical Things Boys Like to Make, The Bruce Publishing Company, Milwaukee, Wisconsin, 1947, 205 pages, $2.25.

With the simple directions in this new project book even the beginner can make fascinating electrical devices that really work. Detailed drawings and step-by-step directions.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	B	B	B	B	B	A

4.* Crawford, John Edmund, Practical Electricity, The Bruce Publishing Company, Milwaukee, Wisconsin, 1939, 288 pages, $1.96.

For students who have not studied electricity before and whose mathematical training has not gone beyond arithmetic, this new text presents material in the clearest and most practical manner possible.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	B	B	B	B	B	B	B

5.* Jones, E. W., Fundamentals of Applied Electricity, The Bruce Publishing Company, Milwaukee, Wisconsin, 1943, 341 pages, $2.00.

A textbook and shop manual covering the fundamentals of electricity and magnetism both theoretically and practically, in up-to-the-minute form. Especially designed for beginning classes in electricity.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

6.* Lehman, Herbert G., Shop Projects in Electricity, American Book Company, New York, New York, 1934, 190 pages, $.96.

This book includes projects for the junior high and senior high school student in electricity. Contains discussions of radios, motors, buzzers, and definitions of terms used. Well illustrated.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	B	A	A	B	B	B	B	B	A

7.* Lister, Eugene C., Electric Circuits and Machines, McGraw-Hill Book Company, New York, New York, 1945, 358 pages, $2.80.

Treatment is largely non-mathematical and limited to simple algebra for the most part. The illustrations include hundreds of figures, diagrams and illustrations of modern electrical equipment.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	B	B	B	A	B

8.* Lush, C. K., and Engle, G. E., Industrial Arts Electricity, The Manual Arts Press, Peoria, Illinois, 1946, 144 pages, $2.20.

The right amount of information, presented in the right way, for junior-high and beginning high-school shop electricity. Modern coverage of the subject, simplified and organized at the desired level.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	C	C	A	B	A	A

9.* Moreton, Dunlap, and Drinkall, Armature Winding, American Technical Society, Chicago, Illinois, 1946, 289 pages, $2.50.

An unusual clearly written book on the construction, winding and repairing of alternating current and direct current motors and generators.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	B	C	B	C	B	B	B

10.* Petersen, Charles F., Fundamentals of Electricity, The Bruce Publishing Company, Milwaukee, Wisconsin, 1936, 112 pages, $.96.

The fundamentals of electricity are presented for students of junior-high school age. Separate lessons give special attention to simplicity and elimination of technical terms.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	C	C	B	B	C	C	C	B	B	B	C

11.* Richter, Herbert P., Practical Electrical Wiring, McGraw-Hill Book Company, New York, New York, 1947, 574 pages, $2.75.

Gives fundamental principles, terminology and theory behind general practices, and methods used in wiring residental buildings, farms, stores, factories, schools, etc. Simple enough for the beginner.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

12.* Uhl, Nelson, and Dunlap, Interior Electric Wiring, and Estimating, American Technical Society, Chicago, Illinois, 1940, 354 pages, $2.75.

A modern how-to-do-it book, related to all phases of interior wiring, including estimates of material and labor. A ready reference book, containing much data, set forth with exactness, and clarity.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	B	C	B	C	C	C	B	B	C

13.* Watson, H. M., and Welch, H. E., and Eby, G. E., Understanding Radio, McGraw-Hill Book Company, Inc., New York, New York, 1940, 601 pages, $3.00.

Includes in its scope radio principles and circuits, alternating and direct-current tubes and receiving sets, oscillators and transmitters, serials, and ultra-short wave sets. Designed especially for beginners.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	C	A	B	B	B	B	C	B

14.* Willoughby, G. A., and Selvidge, R. W., Electric Motor Work, The Manual Arts Press, Peoria, Illinois, 1930, 196 pages, $2.80.

This book includes illustrations and instructions for winding electric motors. Explanations of the phases of electric motors, field coils, winding, etc., are given.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	B	B	B	C	B	C	B	B	B

15.* Wright, F. B., Electricity in the Home and on the Farm, McKnight and McKnight Company, Bloomington, Illinois, 1935, 132 pages, $2.50.

Includes information which the average high school student needs to know and can understand. Of particular value to the electrical class in the rural community.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	A	B	C	A	C	B	B

FORGING

"Forging is generally assumed to be the forming and shaping of hot metals only, but actual practice in this field includes the forming and shaping of cold metals and the tempering of tools," according to the committee on Improving Instruction in Industrial Arts. (1, page 37) In a great many schools in courses in general metal work much forging is done. This indicates that schools have discontinued offering forging as a specific course but still recognize that it has a distinct place in the industrial arts program.

Grade Level. Many of the forging processes are difficult and a high degree of skill is required. Due to these factors and for the protection of immature pupils, the recommendation that courses in forging be placed in the upper half of high school and on a college level seems justified.

Importance. Because forging is a very basic part of such vital industries as machine and automobile mechanics shops, it must necessarily be a part of the well planned industrial arts program. Ornamental iron as a high class phase of forging has for many years held an important place in ornamentation of architectural structures. This phase of forging offers opportunities in creative design and the development of asthelic appreciation. The majority of books written about forging are technical in nature and could not be used in the lower grades, however, some recent books have been written for this purpose.

Offered in Oklahoma. According to the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities School Session, 1949-50 forging as a named course is not offered in the state, but it is generally known that units in forging are frequently taught in connection with courses in general metal work.

A SELECTED BIBLIOGRAPHY

1.* Bacon, John Lord, and Johnson, Carl Gunnard, Forging, American Technical Society, Chicago, Illinois, 1932 113 pages, $1.25.

A practical book on hand forging of wrought iron, machine steel, and tool steel, drop forging and heat treatment of steel. Also includes annealing, hardening, and tempering.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	D	B	D	A	A

2. Coleman, George J., Forge Note Book, The Bruce Publishing Company, Milwaukee, Wisconsin, 1921, 32 pages, $. 35.

A notebook, reference book, and practical textbook all combined in one outline type notebook.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

3.* Harcourt, Robert W., Elementary Forge Practice, The Manual Arts Press, Peoria, Illinois, 1920, 132 pages, $2.50.

Problems of forgework, metal identification, and information on steel manufacture and heat treatment are covered in detail. Processes fully explained. Supported by 38 projects demonstrating operations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	D	B	D	A	C

4. Johnson, Carl G., Forging Practice, American Technical Society, Chicago, Illinois, 1939, 136 pages, $1.50.

A practical volume on hand forging of wrought iron, machine, and tool steel; drop forging, and heat treatment of steel, including annealing, hardening and tempering.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5.* Schwarzkopf, Ernst, Plain and Ornamental Forging, John Wiley and Sons, Inc., New York, New York, 1916, 267 pages, $2.00.

This book has five major divisions including general properties of iron, the forge, blacksmith tools, and practice exercies, the exercises include, hammer wedges, drawing and forming iron, etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	D	A	A	A	A	A	B	B	A	C

6.* Smith, Robert, E., Units in Forging and Welding, McCormick Publishing Company, Wichita, Kansas, 1941, 56 pages, $ .48.

Covers forging, gas welding, electric welding and gives excellent instruction at the beginning level. Emphasizes safe procedures in working with hot metal. Includes 115 illustrations and designs.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	B	D	B	D	A	C

GRAPHIC ARTS

In a great many schools the term "graphic arts" would include a large and extensive department. It is intended in this study that only two areas, letter press printing and bookbinding, be included. The values of courses in printing and bookbinding are different from those of most industrial arts courses in that the skills developed have very little value in the daily life of the home. "Courses in printing are valuable because they motivate learning in the language arts." (25, page 334)

Grade Level. Due to the technical related information which pupils must master in order to become efficient printers and the responsibilities involved in binding books, these courses should not be offered before the last two years in high school and on the college level.

Importance. The invention of the first printing press, which soon led to the making of books on a commercial basis, was among the greatest factors in developing our civilization to its present status. Some of the values derived from printing and bookbinding courses are a knowledge of these two great industries and the ability to evaluate books and printed materials more intelligently. "Printing and binding constitute one of world's largest industries." (25, page 334)

Offered in Oklahoma. Since "graphic arts" could include several different courses, it is impossible to know how many times courses which come under this heading are offered in the

state, but printing, which was listed as one of the fourteen named courses, is listed fifth in courses offered. Bookbinding was not amont the named courses.

A SELECTED BIBLIOGRAPHY

1. Bohrer, Harry P., Progressive Lessons in Printing, International Textbook Company, Scranton, Pennsylvania, 1948, 40 sheets, $1.50.

   Lessons representing work covered in a first year course of approximately 40 weeks and five shop periods a week. Provides fexibility to conform with individual abilities of pupils.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

2.* Cleeton, Glen U., General Printing, McKnight and McKnight Publishing Company, Bloomington, Illionis, 1941, 160 pages, $2.10.

   Contains methods of printing, point system; type parts; measuring type; composing stick and other things which a printer must know. Many clear photographs.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	C	A	D	A	A

3. Clark, Florence E., The Printing Trades and Their Workers, International Textbook Company, Scranton, Pennsylvania, 1932, 132 pages, $1.40.

   A valuable source of information on the printing industry for counselors and students. Comprehensive in scope, developed in readable style and well illustrated.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

4. Groneman, Chris H., General Bookbinding, McKnight and McKnight, Bloomington, Illinois, 1947, 64 pages, $1.00.

Elementary instruction in hand bookbinding, presented through construction of attractive projects, which enables the student to learn by doing. Clear, easy to understand directions.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5.* Hague, C. A., Printing for the Schools, The Bruce Publishing Company, Milwaukee, Wisconsin, 1948, 284 pages, $2.50.

Basic processes and related information of the printing art are presented in this profusely illustrated text. Considers specialized work, such as school newspaper publication, block carving, etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	C	A	B	C	B	D	A	D

6. Karch, Randolph R., Graphic Arts Procedures, American Technical Society, Chicago, Illinois, 1948, 272 pages, $3.75.

As completely new in approach as it is comprehensive in coverage. Does not give undue emphasis to any one phase of graphic arts. Flexibly and logically organized.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

7. Karch, Randolph R., How to Plan and Buy Printing, Prentice-Hall Publishing Company, New York, New York, in preparation.

Tells how a complete printing job can be planned and carried out. Written for the buyer of printing, copy writer, commercial artist, advertising agency employees, and the student.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

8. Kauffmann, Desire, Graphic Arts Crafts, D. Van Nostrand Company, Inc., 1948, 244 pages, $2.25.

A survey of graphic arts processes. Includes everything from how linoleum is made, through the history of wood engraving, down to silk screen printing. A sound, practical text.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

9. Flinefelter, Lee R., Bookbinding Made Easy, The Bruce Publishing Company, Milwaukee, Wisconsin, 1948, 94 pages, $2.00.

Simple, workable instructions for the rebinding of old books, the preservation of magazines, pamphlets government bulletins and other valuable but not serviceable printed materials.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

10.* Lush, Clifton L., Junior Printing, The Manual Arts Press, Peoria, Illinois, 1943, 64 pages, $ .76.

A modern textbook-workbook for the junior high-school print shop. Procedures are clearly described and demonstrated to attract student interest. Proved through years of testing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	A	B	C	B	D	A	C

11. Perry, Kenneth F., and Baab, Clarence T., The Binding of Books, Manual Arts Press, Peoria, Illinois, 1940, 160 pages, $2.50.

A thoroughly illustrated, complete text on the methods, equipment, tools, and processes that are involved in the binding and repair of books. Organized for school use.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

12.* Polk, Ralph W., Elementary Platen Presswork, The Manual Arts Press, Peoria, Illinois, 1931, 148 pages, $2.00.

Covers all basic functions of the platen press and includes discussion of all types of presses. Illustrated with 140 photographs and drawings, sample forms, and type examples.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	C	B	D	A	A

13.* Polk, Ralph W., Elementary Printing Job Sheets, The Manual Arts Press, Peoria, Illinois, 1928, 148 pages, $ .86.

Consists of 51 selected and tested jobs covering the first year's work. An outline for a year's work, and a student's rating sheet accompany each set.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	C	D	B	D	A	A

14.* Polk, R. W., The Practice of Printing, The Manual Arts Press, Peoria, Illinois, 1945, 300 pages, $2.75.

Covers the whole practice of its field from composition and job layout to gathering, folding and covering the finished product. Recognized as the outstanding basic textbook for the beginner.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	B	D	A	A

15. Polk, Ralph W., Type Charts for Printers and Designers, The Manual Arts Press, Peoria, Illinois, 16 charts, $1.00.

Consists of 16 plates of representative styles of type faces. An historical and descriptive sketch of each style is given on the reverse side of the plate.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

HAND WOODWORKING

Wood as a material for the teaching of industrial arts has been utilized for a great many years. In the beginning of this work in education, wood was almost the only material used, and woodworking can thus be called the alpha of industrial arts. Today, even though many new materials have been created which are used extensively in industrial arts courses, woodworking still holds an important position as a basic activity for industrial arts students.

Grade Level. Hand woodworking or bench woodworking probably more than any phase of industrial arts lends itself to all grade levels, from the elementary classroom through high schools and on the college level. No other source is needed to substantiate this thinking than an observation of the number of courses being offered today on all grade levels.

Importance. Hand woodworking is based primarily on developing skill in the use and care of hand tools to the exclusion of power tools and machines. It also includes the development of an appreciation of woods in our everyday living, and the ability to be a handy craftsman in caring for the small jobs with which one may come in contact in his home and occupational environment.

Offered in Oklahoma. A recent Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities School Session, 1949-50 lists 501 schools which offer industrial education courses in

some form. Woodworking in its different phases was listed 391 times, indicating the predominance of woodworking in school shops.

A SELECTED BIBLIOGRAPHY

1.* DeVette, William A., 100 Problems in Woodwork, The Bruce Publishing Company, Milwaukee, Wisconsin, 1927, 207 pages, $1.80.

Presents 100 projects in woodwork. With each drawing is given a limited description of the method of construction and a bill of material. Arranged in order of increasing difficulty.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	D	D	B	D	B	B

2.* Douglas, J. H., and Roberts, R. H., Instruction and Information Units for Hand Woodworking, McCormick-Mathers Publishing Company, Wichita, Kansas, 1939, 128 pages, $.80.

This book lists both informational and operational units pertaining to woodwork. It is well illustrated by pictures and drawings and covers completely hand wood work as a beginning course.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	B	A	B	B	A

3.* Douglas, J. H., and Roberts, R. H., Projects in Woodwork, McKnight and McKnight, Bloomington, Illinois, 136 pages, $3.50.

Detailed drawings for 109 projects, ranging in difficulty from birdhouses, etc., for beginning students to full suites for advanced students. Photographs show project after completion.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	C	C	A	C	A	A

4.* Fryklund, Verne C., and LaGerge, Armand J., General Shop Woodworking, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1948, 160 pages, $1.00.

Clear text instruction is made even more understandable by many line drawings which explain and illustrate each procedure. Provides information on sources, processing, and uses of wood.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	A	A	B	A	B

5.* Gottshall, Franklin H., and Hellum, Amanda W., You Can Whittle and Carve, The Bruce Publishing Company, Milwaukee, Wisconsin, 1948, 96 pages, $2.25.

Here are full directions for carving delightful wooden animals, figures, jewelry, wall plaques, and other novelties with an ordinary pocket knife made easier through step-by-step illustrations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	C	B	C	A	A

6.* Griffith, Ira S., Essentials of Woodworking, The Manual Arts Press, Peoria, Illinois, 1931, 192 pages, $1.64.

A long famous basic textbook on hand tools; shaping, joinery, woods, and finishing. Enjoys wide adoption in every state in the Union. Part I discusses Tools, Part II discusses simple joinery, Part III wood and finishing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	D	A	B	B	A	C	A	D	B	B

7.* Griffith, Ira S., Projects for Beginning Woodwork and Mechanical Drawing, Manual Arts Press, Peoria, Illinois, 1915, 51 pages, $.75.

Combining woodwork and mechanical drawing, this book presents a number of woodworking projects and suggests several methods of treating each project.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	C	C	D	D	B	C	C	C

8.* Griffith, Ira S., and Cox, George B., Woodwork for Secondary Schools, The Manual Arts Press, Peoria, Illinois, 1939, 328 pages, $1.80.

Includes units on common wood and building materials, tools and processes, joinery, woodworking machines, finishing, furniture construction, and wood turning.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	B	B	A	C	A	C	B	B

9.* Hjorth, Herman, Forty Pieces of Fine Furniture, The Bruce Publishing Company, Milwaukee, Wisconsin, 1939, 171 pages, $2.00.

Instructions and bills of material are presented in this book for 40 pieces of furniture. Most of these designs are adaptations of classical prototypes. Well illustrated.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	B	A	C	A	C	A	A

10.* Hjorth, Herman, Principles of Woodworking, The Bruce Publishing Company, 1937, 456 pages, $2.88.

Recently revised and enlarged by over 100 pages this text contains all the essential information on hand and machine tools, processes involved, and instructions for their application.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	B	A	C	B	C	A	B

11.* Hunt, Dewitt, Hand Woodworking, Harlow Publishing Company, Oklahoma City, Oklahoma, 1937, 251 pages, $1.00.

This book covers the complete field of hand woodworking. It lists all of the fundamental operations required in hand woodworking. Among the most up-to-date books in woodworking.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	B	B	B	C	B	B	C	B	B

12.* Johnson, William H., and Newkirk, Louis V., General Woodworking, The Macmillan Company, New York, New York, 1949, 283 pages, $3.00.

The fundamentals of woodworking and the basic introduction to carpentry, cabinetmaking, and pattern making, and carving are covered in this volume. A wide choice of projects is presented.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	B	A	C	A	C	A	B

13.* Lukowitz, Joseph J., 50 Popular Woodworking Projects, The Bruce Publishing, Milwaukee, Wisconsin, 1938, 80 pages, $1.00.

Each project is represented by a clear working drawing, a perspective sketch or photograph, and a short explanatory text. Projects include door stops, blotter holders, candle sticks, stools, and etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	B	C	C	B	C	B	B

14.* Madsen, A. S., and Lukowitz, J. J., Problems in Furniture Design and Construction, The Bruce Publishing Company, Milwaukee, Wisconsin, 1928, 133 pages, $1.70.

The material in this book is rich in design and in variety of construction. It is not limited to any period of furniture style. Each project is presented by a complete working drawing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	B	A	C	B	C	A	B

15.* Mankin, Victor J., Modernistic Chip Carving, The Bruce Publishing Company, Milwaukee, Wisconsin, 1942, 70 pages, $1.25.

A modernized form of chip carving art that has come down through the centuries. The book contains scores of attractive projects all of which can be made with a skew chisel or an ordinary pocketknife.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	C	C	C	B	C	B	B

16.* Milton, Archie S., and Wohlers, Otto K., A Course in Wood Turning, The Bruce Publishing Company, Milwaukee, Wisconsin, 1919, 339 pages, $3.00.

This book contains problems and illustrations in logical sequence in wood turning. Stress is laid upon proper use of the tools, and problems are presented so that each project depends on the one preceeding.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	A	B	B	C	C	B	C	B	B

17.* Nichols, Talmage, Woodworking Manual for Students, The Manual Arts Press, 1930, 79 pages, $.75.

This manual is a guide book. Space is provided for drawings and notes as well as other helpful aids. Includes tool and machine processes, wood finishing, furniture design and construction.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	A	B	B	C	C	B	B	B	B

18.* Schultz, Leo C., and Schultz, Louis J., School and Home Shopwork, Allyn and Bacon, New York, New York, 1935, 246 pages, $3.00.

Six units of everyday shopwork, mechanical drawing, woodworking, general machines, electricity, metal working, and automobile mechanics, are presented in this book.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	B	A	C	A	C	A	B

19.* Shepardson, Ken F., Furnishing the Home Ground, The Bruce Publishing Company, Milwaukee, Wisconsin, 1937, 46 pages, $1.00

Projects in this book are presented so as to allow a choice in design and construction. 18 detailed drawings are given with a brief description of construction.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	B	C	C	B	C	B	B

20.* Sowers, J. I., Woodcarving Made Easy, The Bruce Publishing Company, Milwaukee, Wisconsin, 1936, 95 pages, $1.25.

Carefully graded and organized units in carving. Its approach to the subject is simple enough to encourage the beginner. Many projects have been included and a large number of suggested designs are given.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	B	A	C	B	C	B	B

21.* Tustison, Francis E., Forrests, Trees, and Wood, The Manual Arts Press, Peoria, Illinois, 1936, 95 pages, $.75.

This book includes a discussion of the various woods such as redwood, oak, hickory, maple, birch, cedar, etc. Each unit includes, the tree, properties, and uses.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	B	C	B	B	C	B	B

22.* Tustison, F. E., and Brown, A. G., Instructional Units in Hand Woodwork, The Bruce Publishing Company, Milwaukee, Wisconsin, 1930, 222 pages, $1.48.

Developed on the unit-operative-instruction-sheet plan, this basic course for the upper grades and junior high schools covers the entire range of hand-tool woodworking operations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	B	A	C	A	B

23.* Van Tassel, Raymond, Woodworking Crafts, D. Van Nostrand Company, Inc., 1944, 120 pages, $2.20.

This book starts out with simplest form of woodworking and whittling. It goes on through coping saw work, joinery, inlaying and veneering, wood carving. All directions are easy to follow by beginning pupils.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	B	C	A	C	B	B

HOME MECHANICS

An attempt to provide a variety of practical experiences which would not be limited to any one of the common industrial arts fields, the home mechanics course is composed of a selected group of units which provide opportunities for pupils to learn jobs which are of immediate use, which are interesting, and which will have real value for the students when they become adults.

Grade Level. Because of the nature of the course, its simplicity and the short type job exercises, home mechanics is recommended for the junior high school level for boys and girls both. It can be of much value on the high school level and with adult classes.

Importance. It is of practical value in this machine era that one know how to fix an electric plug, a leaky water faucet, or replace a broken windowpane. The home mechanics course could be called the first aid course for home repairs. Because of the savings to property and large amount of home accidents which can be avoided if repairs are made at the proper time, this course is of much value to students.

Offered in Oklahoma. The idea of home mechanics as a part of industrial arts is quite common. The nature of the course has enabled it to be taught to both boys and girls with satisfactory result. Home mechanics is listed in the study made by H. Roy B. Conner and Kenneth Barlett of industrial arts courses offered in Oklahoma as one of the fourteen named courses. It was listed only five times.

A SELECTED BIBLIOGRAPHY

1.* Bedell, E. L., and Gardner, E. G., Household Mechanics, International Textbook Company, Scranton, Pennsylvania, 1937, 130 pages, $1.00.

The logical relation between the "know what" and the "know how" is developed by means of 148 jobs which introduce pupils to many household maintenance and repair problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	B	D	B	D	A	A

2.* Haines, Van Tassel, Adams, Thompson, Miller, Bailey, DiBernardo, Nowak, Home Mechanic's Handbook, D. Van Nostrand Company, Inc., New York, New York, 1948 1008 pages, $6.95.

Gives information in the various fields such as metalworking, woodworking, plumbing, and electrical work. A set of six volumes, but may be obtained in separate volumes.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	B	D	A	A

3.* Johnson, W. H., and Newkirk, L. V., Home Mechanics, MacMillan Publishing Company, New York, New York, 1947, 302 pages, $2.00.

Includes information and instructional units on common household jobs such as fixing electrical and plumbing fixtures. This text is desirable for junior high and senior high school classes.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	B	D	A	A

4. Schaefer, Carl J., Home Mechanics for the General Shop, The Bruce Publishing Company, Milwaukee, Wisconsin, in preparation.

This complete course in home mechanics is especially valuable to anyone who would benefit from knowing how to make all the ordinary repairs about the home.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5.* Tustison, F. D., Job Sheets in Home Mechanics, The Bruce Publishing Company, Milwaukee, Wisconsin, 1926, Set I & II, $1.00.

Practical home-mechanics jobs selected from the most useful things to be done about the home.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	D	D	D	D	A	A

6.* Woodin, J. C., Home Mechanics for Girls, McCormick-Mathers Company, Wichita, Kansas, 1938, 121 pages, $.80.

This book presents home mechanic problems and gives instructions for repair and construction. The problems are well illustrated and explained.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	B	A	A	A

INDUSTRIAL FINISHES

The rapid changes in the finishing industries during recent years and the accelerated trends toward the use of color have made necessary the teaching of finishes and their psychological influences upon the individual. Several years ago little attention was given to finishing, and attempts were made to "finish" projects in dusty shops. Today, when housing facilities permit, separate rooms are found in all schools where serious attention is given to proper finishing.

Grade Level. Much of the related information about industrial finishes is technical in nature making it impractical to offer it as a course in industrial arts departments. Much of the basic information about finishes is acquired by the pupil through earlier experiences in woodworking classes. Seldom or never is a separate course found in a high school program. In many teacher education departments in college, it is required course of some extent.

Importance. A basic knowledge of color and its application would be usable by every individual because the more information one has about a subject the better he can appreciate it. Recent discoveries by scientists prove that man's moods can be changed by the colors with which he lives. This can be substantiated by the examples of large industries and their work with color conditioning and color dynamics.

Offered in Oklahoma. There is little doubt in the minds of any teacher of industrial arts in this state that a great

deal of finishing is being taught in connection with other subjects, but not one named course of this type is listed in the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities which seemingly indicates that, with the exception of our universities and colleges, no named courses of industrial finish exist in Oklahoma.

A SELECTED BIBLIOGRAPHY

1. Dalzell, Sabin, Painting and Decorating, American Technical Society, Chicago, Illinois, 1938, 152 pages, $2.50.

A how-to-do-it book showing the principles and application of the commonly used paints, varnishes etc., as applied to residences, barns and other structures.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

2.* Jeffrey, Harry R., Wood Finishing, Charles A. Bennett Company Inc., Peoria, Illinois, 1949, 220 pages, $1.75.

A basic, practical handbook for home or school shop use. Covers finishing of new furniture and refinishing of old; also refinishing of automobiles.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	A	D	B	D	B	B

3.* McGee, R. A., and Brown, Arthur G., Instructional Units in Wood Finishing, The Bruce Publishing Company, Chicago, Illinois, 1948, 128 pages, $1.75.

Complete instructional units in wood finishing, based upon the primary jobs and procedure necessary to repair materials, apply stains, fillers, varnishes, etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	B	B	C	B	A	A	B

4.* Newell, A. C., Coloring, Finishing, and Painting Wood, Charles A. Bennett Company, Inc., Peoria, Illinois, 1940, 430 pages, $5.50.

A remarkable, up-to-date coverage of varnishes, stains, paints, abrasives, and other wood and metal finishing materials and their uses. Has been called a "library on the subject" by men who have used it.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	A	D	A	B

5.* Pattou, Albert B., and Vaughn, Clarence L., Furniture Finishing, Decoration and Patching, Frederick, J. Drake Company, Chicago, Illinois, 1944, 55 pages, $1.25.

This book is divided into five book divisions, period furniture, modern styles, furniture finishing, furniture decoration, and special finishes.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	B	A	B	B	D	B	A

6.* Waring, Ralph G., Wood Finishing and Painting Made Easy, The Bruce Publishing Company, Milwaukee, Wisconsin, 1940, 220 pages, $2.25.

This handy manual answers every possible question encountered in the selection and application of suitable finishes to wood and metal. The amateur craftsman will find it a key to distinctive finishes.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	A	D	A	D	A	A

LEATHER WORK

The use of leather has been important for many years. "Records found in the pyramids which date back five thousand years show that it was highly prized at that time." (33, page 103) This industry has continued to grow and holds an important place in the practical world.

Grade Level. Work with leather can be built upon very simple but interesting procedures and operations which can be adapted to the elementary school. Work with leather offers to the student a chance to develop to the fullest his artistic abilities and manipulative skills. These characteristics make leather work an all-grade level subject.

Importance. Leathercraft offers itself readily as a means of creative expression on the part of the pupil. At the same time it does much to develop skill and aesthetic appreciation. Factors which make leathercraft desirable to the industrial arts program are inexpensive tools and equipment, the increase of up-to-date text books and reference materials, and the availability of supplies.

Offered in Oklahoma. For sometime a great deal of leather work has been done in Oklahoma especially in the government Indian schools. In recent years leather work has increased in popularity until in a great many schools leather work is being taught in connection with other courses. The craftsmanlike skills and artistic abilities which an instructor must possess to teach leather work limits the number of schools in which this work is offered.

A SELECTED BIBLIOGRAPHY

1.* Baird, F. O., Leather Art, American Handcrafts Co., Los Angeles, California, 1946, 32 pages, $1.00.

This book includes briefly the various phases of leather work, and illustrates several good designs for leather workers. It is plainly written for beginning pupils in this type of work.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	C	C	A	C	A	B

2.* Cherry, Raymond, General Leathercraft, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1949, 128 pages, $1.50.

This book is divided into four major parts, a brief history of leather, detailed written procedures for fundamental operations, detailed instruction for making many practical projects and many useful designs to aid beginning pupils.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	A	A	A	A	C	A	A

3.* Cramlet, R. C., Fundamentals of Leathercraft, Bruce Publishing Co., Milwaukee, Wisconsin, 1939, 61 pages, $1.00.

A general textbook for the various phases of leatherwork this book includes the story of leather, where to obtain materials, list of tools and equipment needed in working with leather. It also contains instructions and illustrations for the use of the tools.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	C	C	A	C	A	C

4.* Dean, John W., Leathercraft Techniques and Designs, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1950, 325 pages, $5.00.

For use in both phases of leatherwork, that of design and techniques of working with leather this book serves a dual purpose in a school shop. It is one of the most up-to-date publications in its field.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	A	A	A	A	A

5.* Dean, John W., 107 Leathercraft Designs, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1950, 50 plates, $2.00.

One of the most complete books of designs ever published, this book is a must for every leather work shop. It includes 107 well chosen designs which require various degrees of skill to make.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	A	B	B	B	B	A	A

6.* Griswold, Lester, Handicraft, Colorado Springs Publishing Co., Colorado Springs, Colorado, 1942, 512 pages, $3.00.

This book is capable and workman like. It is comprehensive in scope and clearly written. An efficient guide to the subject, it also includes many other artscraft such as lapidary work, art metal work, etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	C	C	A	C	A	A

7.* Groneman, Chris H., Applied Leathercraft, The Manual Arts Press, Peoria, Illinois, 1942, 210 pages, $3.00.

This is an elementary book on leather craft which includes many designs and complete information on leather work processes. Photographs show all processes and finished projects. A thirty page section is given to designs.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	C	A	C	A	B

8.* Hoefer, Louise C., Designs for Carved Leather, Leisure Craft, Los Angeles, California, 1943, 18 plates, $1.00.

This booklet consists of eighteen well designed plates for carved leather projects. A book of this type is essential to any leathercraft course taught in our schools.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	C	A	C	A	B

9.* Hoefer, Louise C., Design for Tooled Leather, Book I, Leisure Craft, Los Angeles, California, 1943, 18 plates, $1.00.

The purpose of this book is to give the leather worker a number of well planned designs to make his projects. These designs are of good selection and are useful to the beginning student in leatherwork.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	C	A	C	A	B

10.* Hoefer, Louise C., Design for Tooled Leather, Book II, Leisure Craft, Los Angeles, California, 1948, 18 plates, $1.00.

The purpose of this book, similar to book I, is to give the leather worker a number of well planned designs to make his projects. The designs range from small key cases to ladies hand bags.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	C	A	C	A	B

11.* Hoefer, Louise C., Monograms and Designs for Leather Craft, Leisure Craft, Los Angeles, California, 1947, 20 plates, $1.00.

A selection of designs needed by all leather work classes, this booklet includes twenty well chosen designs. These designs are useful to every leather craft worker whether he be amateur or professional.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	C	A	C	A	B

12.* Hoefer, Louise C., New Designs for Leather Craft, Leisure Craft, Los Angeles, California, 1948, 64 designs, 12 plates, $1.50.

This booklet includes twelve plates, sixty-four designs. It is a valuable book for any leather craft class. These designs lend themselves well to construction of small inexpensive projects which are quite useful in beginning leatherwork.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	C	A	C	A	B

13.* Lemos, Pedro J., Leathercraft, Davis Press, Inc., Worchester, Massachusetts, 1940, 96 pages, $1.00.

This book is one of the best general leathercraft publications of its day. Although this book was published in 1940 it is still of great value to the leathercraft shop or our schools.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	C	C	A	C	A	B

14.* Sitkin, G. and J., Lacing From Start to Finish, Kit Kraft, Los Angeles, California, 1947, 13 pages, $.25.

The title of this book tells the complete story of lacing from start to finish. In the simplest illustrations possible this book shows lacing in the various phases.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	C	A	C	C	C	C	B	A

15.* Thompson, Robert L., Leathercraft, D. Van Nostrand Co., New York, New York, 1947, 140 pages, $2.20.

This book has been written for the beginning leathercraftman. It is not a technical treatise of leather work. It may be used as a course of study in leather work for the elementary and secondary school pupils, especially in the individual arts.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	C	A	C	A	B

MACHINE WOODWORKING

The position of lumbering as a basic industry in our country, of which machine woodworking is a definite part, is clearly stated by Nelson C. Brown in Lumber. (6, page 21)

> It is estimated that the utilization of our forests including the logging, manufacture, sale, transportation, and final use of its varied products, provides complete or partial support for from 8% to 10% of our people.

Grade Level. Due to the dangers involved in machine woodworking, it should be offered only to the more mature students. It is desirable for the students to have completed one year of hand wood work and a beginning course in mechanical drawing. A Course of Study in Machine Woodworking, 1A and 1B, published by the Curriculum Division of the Oklahoma State Department of Education in 1942 includes the statement: "Owing to the prerequisites, the students would probably be in the tenth or eleventh year." (6, page 3)

Importance. A great deal of daily living brings the individual in contact with something made of wood. Typical examples showing the importance of wood are houses for shelter, and furniture for living comfort. Woodworking offers many learning situations. Besides the skills involved in machine woodworking classes, there is also a certain amount of appreciation for things made of wood, and an opportunity for vocational exploration.

Offered in Oklahoma. "There is no doubt that machine woodworking is the most common high school industrial arts

course in Oklahoma schools," is another statement found in the Oklahoma course of study. (6, page 1) "The attraction of working with fast moving machinery and the lure of producing a fine piece of furniture account in a large measure for the continued popularity of this high school industrial arts subject." (6, page 1) This statement may explain in part the preponderance of woodworking in Oklahoma schools.

A SELECTED BIBLIOGRAPHY

1.* Douglass, J. H., and Rogerts, R. H., Projects in Woodworking, McKnight and McKnight, Bloomington, Illinois, 1948, 136 pages, $3.50.

Detailed drawings for 109 projects, ranging in difficulty, from birdhouses to full suites of furniture. Photographs of projects enable the students to see how they will look after completion.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	B	D	B	D	A	B

2.* Ensinger, E. W., Problems in Artistic Wood Turning, The Bruce Publishing Company, Milwaukee, Wisconsin, 1946, 72 pages, $2.75.

A wide variety of really artistic problems in wood turning illustrating the fundamental principles and common processes of the craft. Numerous excellent detailed drawings and photographic illustrations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	D	D	B	B

3.* Gottshall, Franklin H., How to Design Period Furniture, The Bruce Publishing Company, Milwaukee, Wisconsin, 1947, 272 pages, $5.00.

Treats all important phases of the art of designing furniture in as practical a manner as possible. Contains chapters on principles of design, period styles, upholstering materials, and mechanics of design.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	A	D	D	D	A	C

4.* Griffith, Samuel I., Essentials of Woodworking, Manual Arts Press, Peoria, Illinois, 1922, 218 pages, $1.85.

A long-famous basic textbook on hand tools, shaping, joinery, woods, and finishing. Discusses tools and elementary processes, joinery, wood and wood finishing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	B	B	A	D	A	B	A	C

5.* Grimwood, Herbert H., and Goodyear, Frederick, An Introduction to Decorative Woodwork, Manual Arts Press, Peoria, Illinois, 1936, 238 pages, $6.00.

A book of design which makes use of decoration, proportion, shaping, chamfering, gouging, tooling, mouldings, turning, finishing, and coloring. Contains designs both plain and highly decorative.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	D	B	C	D	B	C	D	A	B

6.* Haines, Adams, Tassel, and Thompson, Carpentry and Woodworking, D. Van Nostrand Company, Inc., New York, New York, 1948, 152 pages, $1.30.

Concerns the varieties of wood and the tools, materials, operations, and processes that are familiar to the woodworker. Various types of wood are described.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	C	B	A	B	A	B	D	A	D	A	B

7.* Henderson, Hiram, L., The Air Seasoning and Kiln Drying of Wood, Hiram L. Henderson Company, Albany, New York, 1946, 332 pages, $4.75.

Includes much of the needed information about methods of drying lumber. Discusses these topics completely, kiln drying, air seasoning, and how wood is dried.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	B	A	B	A	A	A	A

8.* Hjorth, Herman, Basic Woodworking Processes, The Bruce Publishing Company, Milwaukee, Wisconsin, 1945, 250 pages, $2.00.

List, describes, and illustrates in detail the most important hand tool operations and jobs in elementary woodworking. Each operation is arranged in step-by-step form.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	D	D	A	D	A	A

9.* Hjorth, Herman, Forty Pieces of Fine Furniture, The Bruce Publishing Company, Milwaukee, Wisconsin, 1939, 171 pages, $3.00.

Mr. Hjorth, author of several popular woodworking texts, offers here a new group of furniture designs. He begins with a very complete chapter on veneering and inlaying followed by a discussion of simple wood carving.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	B	A	D	A	D	A	B

10.* Hjorth, Herman, Machine Woodworking, The Bruce Publishing Company, Chicago, Illinois, 1937, 384 pages, $3.25.

An advanced text on woodworking machines and their uses in industry. Planned for use as a textbook in technical, trade, and vocational schools. Offers a wide range of information.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	A	A	A	A

11.* Hjorth, Herman, Operation of Common Woodworking Machines, The Bruce Publishing Company, Chicago, Illinois, 1942, 176 pages, $1.72.

For beginners in machine woodworking. Designed for use in high school woodworking shops, it describes the machines and the principal operations that can be performed on them.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	A	D	A	A

12.* Hooper, Rodney, Modern Furniture Making and Design, The Manual Arts Press, Peoria, Illinois, 1939, 160 pages, $5.00.

Designs for traditional styles as well as variations. Main construction points illustrated by drawings and photographs. Considers furniture for living room, dining room, bedroom, and garden.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	B	A	D	B	D	A	B

13.* Hunt, Dewitt, A Manual for Machine Woodworking, Harlow Publishing Company, Oklahoma City, Oklahoma, 1925, 222 pages, $1.75.

This manual for machine woodworking includes the basic knowledge needed in machine woodworking. Begins with getting out stock and then progresses to the more complex machine operations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	B	B	A	D	D	A	B	A	B

14.* Johnson, W. H., and Newkirk, L. V., Fundamentals of Shopwork, The Macmillan Company, New York, New York, 1943, 200 pages, $2.00.

Prepared at the request of the War Department as a training course outline by the U. S. Office of Education, this book contains the fundamentals of shop work essential to shop organization and operation.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	B	D	A	A

15.* Klenke, W. W., The Art of Wood Turning, Charles A. Bennett, Company, Inc., Peoria, Illinois, 1937, 122 pages, $2.25.

Includes 70 attractive projects. Photographs show each project completed. Contain chapters concerning selecting a lather, tools, equipment, grinding, sharpening, spindle work and other operations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	B	D	B	B

16.* Mario, Dal F., Modern Furniture, Reiltold Publishing Corporation, New York, New York, 1949, 170 pages, $5.00.

Basically this book is made up of ultra-modern designs. Includes designs of all types of furniture. Some designs are too far advanced for machine woodwork on the industrial arts level.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	C	A	B	D	F	B	D	C	D	B	C

17.* Meyer, Louis H., Plywood What It is--What It Does, McGraw-Hill Book Company, New York, 1947, 250 pages, $3.50.

Complete treatment of the physical properties and uses of plywood and kindred laminates. Clearly sets forth their composition and structural and mechanical characteristics.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	B	B	D	B	D	B	B

18.* Pelton, B. W., Furniture Making and Cabinet Work, D. Van Nostrand Company, Inc., New York, New York, 1949, 596 pages, $6.95.

Contains hundreds of actual constructions, complete with step-by-step directions for making, repairing, or rebuilding furniture. Gives complete directions for home remodeling operations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	A	C	B	D	B	D	B	B

19.* Pope, Blance R., Upholstering Home Furniture, Charles A. Bennett Company, Inc., Peoria, Illinois, 1948, 303 pages, $3.75.

Based on methods developed through years of experience in conducting a famous adult upholstering class. Simple-direct style of explanation makes it easy to follow procedures involved.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	B	B	B	D	C	D	A	A

20.* Raeth, G. A., Master Homecraft Projects, The Bruce Publishing Company, Milwaukee, Wisconsin, 1942, 160 pages, $2.00.

Combined with excellent designs is a complete explanation of construction procedures and detail of material specifications. So clearly presented that the student can follow instructions without help.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	B	B	B	D	B	C	D	B	B

21.* Shaver, Richard, Furniture Boys Like to Build, The Bruce Publishing Company, Milwaukee, Wisconsin, 1938, 216 pages, $3.00.

In this book simple furniture pieces are presented for both average and slow boys. Arrangement allows each pupil to advance as rapidly as his natural ability permits.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	C	D	A	B	B	D	C	D	D	A	C

22.* Silvius, G. H., and Baysinger, G. B., Safe Work Practice in Woodworking, American Technical Society, Chicago, Illinois, 1946, 82 pages, $.60.

This small booklet is simply written and understandable to the average high school student. It is a booklet which every industrial arts library should own.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	B	A	A	A	A	B	A

23.* Bowers, J. I., Visualized Projects in Woodworking, McGraw-Hill Book Company, Inc., New York, New York, 1945, 89 pages, $1.60.

Gives in visual form a course of individualized construction in woodwork. Projects are presented in graded sequence in three sections, with a special section of more difficult work.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	D	D	B	D	B	B

24.* Bowers, J. I., Woodworking Through Visual Instruction, International Textbook Company, Scranton, Pennsylvania, 1938, 71 pages, $1.50.

Gives visual instruction from a course of construction in woodwork for the junior high school grades. No discussion of tools, processes, lumbering, period, styles, or wood finishing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	A	B	B	D	D	C	D	B	B

25.* Smith, R. E., Machine Woodworking, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1948, 152 pages, $2.75.

Covers the operation and care of lathes, grinders, saws, jointers, planers, mortising machines, shapers, routers, and sanders. Includes 224 illustrations demonstrating procedures.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	A	A	D	A	A	A	A

26.* Van Tassel, Raymond, Woodworking Crafts, D. Van Nostrand Company, Inc., New York, New York, 1947, 194 pages, $2.75.

Presents instructional handicraft material for those who want to begin working with wood by exploring the art. Includes whittling, coping saw work, wood carving, elementary joinery, and woodturning.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	A	B	D	C	D	A	B

27.* Varnom, William H., Creative Design in Furniture, Manual Arts Press, Peoria, Illinois, 1937, 160 pages, $2.70.

How to design modern furniture. Complete development of values and methods for attractive, successful work. Contains technique and terminology of modern design and its functional spirit.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	A	A	A	B

MECHANICAL DRAWING

Mechanical drawing is fundamental to all industry because it is the only adequate means by which the designer can convey to the craftsman facts about a project prior to its construction. It is very important that the designer have a method by which details of the project can be given the craftsman so that the project can be developed in the factory without the personal supervision of the designer.

Grade Level. Due to the versatility of the mechanical drawing course, it is recommended on the junior high, the high school, and the college level. The grade level would necessarily be determined by the structure of the course offered. Many fields of mechanical drawing provide new and interesting courses and experiences at the several grade levels.

Importance. Viewing mechanical drawing as it is used in the machine era, it is readily seen that a course in mechanical drawing is indispensable in the industrial arts program. It is the duty of industral arts teachers to assist their pupils in preparing themselves for a happier, more intelligent adjustment to life by teaching them facts concerning modern industry. Much of the written material today is supplemented by drawings, graphs, and maps. An ability to read drawings is necessary before an individual can be a proficient work in industry.

Offered in Oklahoma. Information found in the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities School

Session, 1949-50, lists mechanical drawing 112 times as a named course. This indicates the importance of mechanical drawing as a school subject.

A SELECTED BIBLIOGRAPHY

1. Bailey, Charles H., Mechanical Drawing For Beginners, The Manual Arts Press, Peoria, Illinois, 1940, 96 pages, $ .60.

   A drawing book for beginners which gives the fundamental techniques of modern drawing practices. The fundamental principles of working drawings are presented through a series of progressive problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	D	A	D	B	B

2. Bennett, Charles A., Lettering Sheets, Charles A. Bennett Company, Inc., Peoria, Illinois, 25 sheets, $ .15.

   Handy ruled sheets as described in Beginning Problems in Mechanical Drawing. In packets of 25 sheets.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

3.* Berg, Edward, Mechanical Drawing, Bruce Publishing Company, Milwaukee, Wisconsin, 1942, 180 pages, $2.25.

   Conforms to the newly revised American Standards Association. Develops those traits teachers feel contribute most toward general educational development, vocational preparation, and avocational use.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	A	D	A	B	A	B

4. Coover, Shriver L., Workbook In Mechanical Drawing, McGraw-Hill Book Company, New York, New York, 1947, 201 pages, $1.48.

Suitable for the school or home workshop, the material is geared to the actual needs and interest of beginners in mechanical drawing. Enables each student to progress at his own speed.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5.* Dalzell, J. R., Building Trades Blueprint Reading, Vol. I., American Technical Society, Chicago, Illinois, 1929, 142 pages, $2.25.

Includes the fundamentals of blueprint reading, using a plan which does not require a mechanical drawing background, and which develops the reader's ability to visualize.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	D	D	A	D	A	A

6.* Dalzell, J. R., Building Trades Blueprint Reading, Vol. II., American Technical Society, Chicago, Illinois, 1930, 92 pages, $2.25.

The nine blueprints constitute regular working drawings for a residence and apartment building and a commercial building. Examination questions are included.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	D	D	A	D	A	A

7.* Dalsell, J. R., and McKinney, James, Architectural Drawing and Detailing, American Technical Society, Chicago, Illinois, 1946, 212 pages, $2.50.

Presents the general principles, practices, and techniques of architectural drawing and detailing, in pen and ink. Includes a discussion of each principle, followed by simple directions.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	B	D	D	B	D	A	B

8.* Elwood, Frank G., Architectural Drawing Plates, The Manual Arts Press, Peoria, Illinois, 1919, 15 plates, $ .84.

A brief textbook on the drawing of plans for a residence, each plate is an example of careful, correct technique.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	B	B	D	D	B	D	B	B

9.* Elwood, Frank G., Problems in Architectural Drawing, The Manual Arts Press, Peoria, Illinois, 1924, 131 pages, $3.00.

Intended to follow an elementary course in mechanical drawing. Complete treatment of special characteristics in architectural drafting, design and execution, construction of building.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	B	B	D	D	B	D	B	B

10. Ericson, E. E., and Soles, R. L., Planning Your Home, Manual Arts Press, Peoria, Illinois, 1938, 131 pages, $2.00.

Included are 25 working units designed for four semesters' study of drafting applied to home problems. Principles are studied in terms of the individual home.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

11.* Ermeling, W. W., Fischer, F.A.P., and Green, G. G., Mechanical Drawing, First Year, The Bruce Publishing Company, Milwaukee, Wisconsin, 1924, 80 pages, $.45.

Introduces the student to the fundamentals of projection, lettering, geometric construction, isometric sections, developments, and freehand drawing. Problems are of the practical type.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	A	B	A	D	D	A	D	A	A

12.* Ermeling, W. W., Fischer, F.A.P., and Green, G. G., Mechanical Drawing, Second Year, The Bruce Publishing Company, Milwaukee, Wisconsin, 1940, 120 pages, $.75.

Outlines work for the first semester with information and problems in revolution and penetration of objects. Application of these principles is made in a number of sheet-metal problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	A	D	A	D	A	B

13.* French, Thomas E., Engineering Drawing--New Seventh Edition, McGraw-Hill Book Company, New York, New York, 1947, 702 pages, $4.00.

This revised popular text, imbodies new standards and improvements developed during the past six years. Deals with fundamentals of shading and special methods used in illustrations for production.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	A	A	A	A	A

14.* French, T. E., and Svensen, C. L., Mechanical Drawing, McGraw-Hill Publishing Company, New York, New York, 1948, 437 pages, $2.80.

Presents mechanical drawing as a real language--the language of industry. Seeks to develop power of visualization, constructive imagination, and training in exactness.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	B	D	A	A

15.* Fryklund, Verne C., and Kepler, F. R., General Drafting, McKnight and McKnight Publishers, Bloomington, Illinois, 1938, 160 pages, $1.00.

Presents the fundamentals of each drafting principle in two parts: (1) operations and (2) information topics. Problems are presented with a range in difficulty to provide for individual differences.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	A	A	B	A	D	A	A

16.* Geisecke, Mitchell, and Spencer, Technical Drawing, MacMillan Publishing Company, New York, New York, 1942, 851 pages, $4.50.

Intended as a class text and reference book in technical drawing. Contains a very large number of problems covering every phase of the subject constituting a complete teaching unit.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	B	A	D	A	A	A	A

17.* Green, Daniel, Drawing for Life and Industry, The Bruce Publishing Company, Milwaukee, Wisconsin, 1945, 188 pages, $1.56.

A new approach to the teaching of drawing stressing greater application to life situations useful to all individuals. Organized in terms of 58 well graded projects.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	A	A	B	D	A	B

18.* Moulsher, R. P., and Mays, A. B., Basic Units in Mechanical Drawing, John Wiley and Sons, New York, New York, Book I, 1933, 289 pages, $1.60.

Complete in all phases of mechanical drawing, this book divides each unit into five small learning units, purpose, what you should know, how to do, questions, and problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	B	D	A	D	A	A

19.* Hunt, Dewitt, Mechanical Drawing, Harlow Publishing Company, Oklahoma City, Oklahoma, 1926, 104 pages, $1.20.

This textbook has two purposes; the first presents drawing problems in a practical sequence from simple to complex, the other presents the informational material of mechanical drawing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	B	A	A	D	D	A	D	A	B

20.* Johnson, W. H., and Newkirk, L. V., Modern Drafting, The Macmillan Company, New York, New York, 1944, 177 pages, $2.50.

Intended as an introduction to the field of modern drafting. The first six units deal with fundamentals of drafting, and the last six present special industrial applications.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	B	A	A	B	D	B	B

21.* Kepler, Frank R., Mechanical Drafting Handbook, The Bruce Publishing Company, Milwaukee, Wisconsin, 1944, 141 pages, $ .84.

Fifty carefully graded problems illustrating all the principles of perspective and the techniques of applying them to typical forms and combinations of forms.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	B	A	A	D	A	D	A	B

22. Kepler, F. R., Nicholson, F. S., Sloat, W. G., and Tucker, N. R., An Analysis of Drafting For Teachers, D. C. Heath and Company, Chicago, Illinois, 1944, 159 pages, $1.50.

A complete analysis, in outline form, of the content of mechanical and engineering drawing. Includes material on guidance and offers instructors, assistance in teaching drafting.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

23.* Klenke, W. W., and Hayes, C. J., Advanced Mechanical Drawing for High Schools, International Textbook Company, Scranton, Pennsylvania, 1941, 316 pages, $1.75.

Advanced instruction in sheet metal drawing, machine drawing, structural work, architectural draftsmanship and elements of perspective drawing with projects, problems and numerous plates.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	A	D	A	B

24.* Klenke, W. W., and Hayes, C. J., Elementary Mechanical Drawing, International Textbook Company, Scranton, Pennsylvania, 1940, 250 pages, $1.60.

First in a series of two textbooks designed to develop an understanding of the fundamental principles of mechanical drawing in junior high, senior high, trade and vocational schools.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	D	A	D	A	B

25.* Mattingly, E. N., and Scrogin, E., Applied Drawing and Design, McCormick-Mathers Company, Wichita, Kansas, 1940, 225 pages, $ .96.

This book is based on problem construction from the simple to complex. Includes both mechanical and architectural drawing. A complete course in mechanical drawing on the high school level.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	C	A	A	B	B	A	A	A

26.* McGee, R. A., and Sturtevant, W. W., General Mechanical Drawing, The Bruce Publishing Company, Milwaukee, Wisconsin, 1935, 192 pages, $1.64.

Especially prepared to keep pace with the junior high school movement, this book offers a most substantial course in mechanical drawing. Material of vocational adjustment value is provided.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	D	D	A	D	A	A

27. Michelson, H. W., and Buck, R. O., Sketching for the Draftsman, The Bruce Publishing Company, Milwaukee, Wisconsin, 1930, 112 pages, $ .88.

Fifty carefully graded problems illustrating all the principles of perspective and the technique of applying them. Can be used independently or in connection with any standard textbook.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	C	A	A	B	B	D	B	D	B	B

28.* Nicholson, Fred, Mechanical Drawing, D. Van Nostrand Company, Inc., New York, 1946, 211 pages, $3.00.

Suited for the more advanced phases of mechanical drawing, this book is designed to bring the drafting room of industry into the high school class room.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	B	A	D	B	A	A	A

29.* Roberts, William E., Beginning Mechanical Drawing, Manual Arts Press, 1943, 111 pages, $1.80.

A course in beginning drawing for junior and senior high school students; includes lettering fundamentals, drawing projections, and assembly and detail drawings.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	B	D	D	A	D	A	A

30.* Shaeffer, Glenn N., Introductory Mechanical Drawing Problems, The Bruce Publishing Company, 1945, 47 pages $ .50.

A drawing book of problems prepared for the junior high school, this book offers an economical means of supplying the students with a collection of progressive problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	D	B	B	D	B	B

31.* Townsend, Gilbert, and Dalzell, R. J., How to Plan a House, American Technical Society, Chicago, Illinois, 1942, 525 pages, $5.00.

The apprentice, building tradesman, builder, architectural student, and the prospective home-owner will find this book full of basic and authoritative information on planning.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	B	A	A	D	B	D	A	A

32.* Waffle, Harvey W., Arthitectural Drawing for High Schools, The Bruce Publishing Company, Milwaukee, Wisconsin, 1939, 320 pages, $2.75.

Excellent as "tryout" material for boys who believe they want to enter the field of architecture or any of the occupations connected with building. Introduces complete building construction.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	D	B	A

33.* Zipprich, A. E., Freehand Drafting, D. Van Nostrand Company, Inc., New York, New York, 1924, 131 pages, $2.40.

This book includes 170 problems and exercises in freehand drafting with additional explanatory material. The purpose of this book is to allow the student to acquire the fundamentals of mechanical drawing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	D	A	D	A	A

PLASTICS

The educator of today must be alert. Time and efforts spent in teaching must be given to those things which are most important to daily living. That plastics is a field which touches everyday living is evidenced by the fact that there are now included among plastic products everything from clothespins to coffins. "Consumers have benefited by more than 25,000 improved products." Arthur Dunham wrote in his book Working With Plastics. (10, page 213)

Grade Level. A material which lends itself well to the industrial arts program, plastics offers such a variety of experiences that it is recommended in both junior high and high school.

Importance. As well as being one of the nation's leading industries, plastics is a desirable material for the school shop. It offers many learning situations found in both wood and metal. Many plastics can be processed with inexpensive tools and equipment and when properly finished are very attractive. Work in plastics gives the student a chance to develop his artistic abilities to the fullest.

Offered in Oklahoma. At the present time very few schools in this state give attention to work in plastics. Oklahoma with its raw materials (oil, soya beans, etc.) which are basic to some plastics should give no small amount of time to teaching its youth the values of these materials.

A SELECTED BIBLIOGRAPHY

1.* Adams, John V., Plastic Arts Crafts, D. Van Nostrand Co., Inc., New York, New York, 1948, 147 pages, $2.20.

Designed to teach by doing, this book uses basic projects for the beginner. An ingenious system of numbering each process as it is introduced enables the student to review the original instruction without the aid of the instructor.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	B	A	A	B	C	B	C

2.* Cherry, Raymond, General Plastics, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1941, 160 pages, $1.50.

This book presents in a concise and comprehensive way much related information and many fundamental operations required in the construction of plastic projects. Numerous projects of good design are also included in this book.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	A	C	A	D	A	B

3.* Davis, Robert L., and Beck, Ronald D., Applied Plastic Product Design, Prentice-Hall, Inc., New York, New York, 1946, 285 pages, $4.50.

This book features the practical and simplified approach to the design of plastic products. The material is arranged to serve a twofold purpose. It meets the requirements of colleges with plastics courses and provides information needed for designing.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	C	B	A	A	B

4.* DeWick, Ernest S., and Cooper, John, Plastic Craft, The MacMillan Co., New York, New York, 1946, 184 pages, $5.00.

This book gives a clear and concise outline of the processes necessary for teaching plastics. It lists many well illustrated projects suitable for both junior high and senior high schools.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	A	A	B	C	C	B	A	B	B

5.* DuBois, J. H., Plastics, American Technical Society, Chicago, Illinois, 1945, 447 pages, $5.00.

This book conveys the basic knowledge regarding the physical, chemical and electrical properties and their limitations. Recent investigations in the synthetic rubber field and developments in the low pressure laminating field are included.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	B	A	C	A	C	A	B

6.* DuBois, J. H., and Pribble, W. I., Plastics Mold Engineering, American Technical Society, Chicago, Illinois, 1947, 494 pages, $7.00.

Experienced mold designers and those just entering the field will find this book essential to the study of this important industry. In addition to detailed descriptions of the design of various molds, there is the knowledge gained from long experience.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	C	A	C	B	A	A	B

7.* Dunham, Arthur M., Working With Plastics, McGraw-Hill Book Co., Inc., New York, New York, 1948, 230 pages, $3.50.

Dunham presents the relatively new field of plastics craft in the light of current educational pedagogy. The projects are arranged in logical sequence from simple to more complex and the book covers general information. A helpful glossary is included.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	A	B	B	A	B

8.* Fleck, H. Ronald, Plastics, Chemical Publishing Co., Inc., Brooklyn, N. Y., 1945, 325 pages, $6.50.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	C	B	C	A	C	A	A	A	B

9.* Groneman, Chris H., Plastics Made Practical, The Bruce Publishing Co., Milwaukee, Wisconsin, 1948, 324 pages, $4.50.

This book is intended to serve as a reference guide for elementary information on the more commonly known plastics. It provides suggestions for processes which will aid the beginner in this new creative handicraft.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	B	A	B	A	B

10.* Kellaway, F. W., and Meadway, N. P., Introducing Plastics, John Crowther Publication, 1944, 80 pages, $3.25.

Kellaway and Meadway present the story of plastics accurately and interesting. Without giving details this book provides an overall picture of plastics. To provide full understanding of the subject the essential chemistry is discussed.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	B	B	A	B	B	C	C	B

11.* Lockrey, A. J., Plastics in the School and Home Workshop, C. Van Nostrand Co., Inc., New York, New York, 1945, 239 pages, $2.75.

This book majors on the use of the less expensive plastics and simple tools which are used in the average school shop. The text gives a solid course in plastic working translated in terms of specific projects.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	A	C	A	A	A	B

12.* Mansperger, Dale E., and Pepper, Carson W., Plastics: Problems and Processes, International Textbook Co., Scranton, Pennsylvania, 1938, 187 pages, $2.50.

Based on the problems and processes involved in working with plastics, this book makes use of inexpensive plastics and simple tools. The books simplicity is desirable for pupil study.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	B	A	A	A	A	A	B

13.* Newkirk, L. V., Hewitt, C., and Zutter, L., Adventures in Plastics, The D. C. Heath and Co., Dallas, Texas, 1947, 270 pages, $3.50.

This book has been attractive projects which can be made from commonly known plastics. Step-by-step procedures for construction of each project are given. General information on plastics and plastics manufacturers is also given.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	B	B	B	C	B	A	B	A	B

14.* Plasters, Plastics in Industry, Chemical Publishing Co., Inc., Brooklyn, New York, 1941, 241 pages, $5.00.

This book was written for individuals wishing to go beyond the surface of plastics. The author views plastics from a manufacturing standpoint and lists much technical information about the manufacturing processes.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	C	C	C	B	B	A	C	C	C	A	B

15.* Robinson, Clark N., Meet the Plastics, The MacMillan Co., New York, New York, 1949, 172 pages, $3.75.

With intentions to inform, not to confuse, this book is factual and conservative. Its purpose is to give much needed information about plastics and at the same time avoid many details.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	C	A	A	B	B

PROFESSIONAL BOOKS

A SELECTED BIBLIOGRAPHY

1.* Bawden, William T., and Others, Industrial Arts in Modern Education, The Manual Arts Press, Peoria, Illinois, 1934, 158 pages, $1.75.

Presented in this book is an adequate discussion of the philosophy, objectives, methods, trends, and administrative problems of the industrial arts in education.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

2.* Bennett, Charles A., History of Manual and Industrial Education, Charles A. Bennett Company, Inc., Peoria, Illinois, Vol. I, to 1870, 1926, 461 pages, $5.00.

A clear, stimulating story of the real values behind present day formulas, as interesting and educational as any current fight for advancement in educational fields.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

3.* Bennett C. A., The Manual Arts, The Manual Arts Press, Peoria, Illinois, 1917, 116 pages, $1.00.

Discusses the problems of manual arts in education being vocational or cultural. This book has several chapters taken from articles which appeared in magazines previous to the writing of the book.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

4.* Bonser, F. G., Industrial Arts for Public School Administrators, Bureau of Publications, Teachers College, Columbia University, New York, New York, 1930, 95 pages, $1.50.

The purpose of this book is to give the teacher an idea of what students should do in the industrial arts at various grade levels. Also course organization, and methods of measuring results.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

5.* Crispin, Frederic S., Dictionary of Technical Terms, The Bruce Publishing Company, Milwaukee, Wisconsin, 1946, 436 pages, $2.75.

Completely enlarged, this 1946 revision, contains new classifications and terms used in the most widely practiced trades and craft, and in the related fields of art and science.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	A	D	A	A

6.* Ericson, Emanuel E., Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1946, 384 pages, $4.00.

How to improve one's own teaching; methods of organizing equipment and courses of instruction for various given situations; shop discipline; progress evaluation and work in the community.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	A	A	A

7.* Estabrooke, Edward C., and March, R. R., 250 Teaching Techniques, The Bruce Publishing Company, Milwaukee, Wisconsin, 1943, 132 pages, $1.25.

Some of the topics presented in this helpful little volume are: the qualities of a good instructor, the conducting of shop activities, and the planning and presenting of a lesson.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	B

8.* Friese, John F., Course Making in Industrial Education, Charles A. Bennett Company, Inc., Peoria, Illinois, 1946, 297 pages, $3.50.

Sound of definition, sure in coverage of all important phases. How each part of a healthy program in vocational or industrial arts is worked into efficient courses of study.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	A	A	D	A	A

9.* Griffith, Ira A., Teaching Manual and Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1920, 229 pages, $2.00.

The purpose of this book is to aid the beginning teacher in his training as a student and also to aid him as a teacher.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	C	A	D	A	A

10.* Groneman, Chris H., and Williams, E. L., Exploring the Industries, The Struck Company, Austin, Texas, 1944 160 pages, $ .70.

Designed for a worktext in the general shop laboratory, this book provides a well organized guide for the general shop.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

11.* Leighbody, Gerald B., Methods of Teaching Industrial Subjects, Delmar Publishing Company, Albany, New York, 1946, 177 pages, $3.50.

A well designed book containing many interesting chapters such as: Teaching and Learning, The Lesson and its Content, Preparing to Teach the Lesson, and Methods of Presenting New Skills.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

12.* Mays, Arthur B., and Casberg, Carl H., School Shop Administration, The Bruce Publishing Company, Milwaukee, Wisconsin, 1943, 228 pages, $2.50.

Included are discussions of shop planning; selecting, purchasing, and storing supplies; issuing supplies and tools; records and inventories; safety; routing projects; and shop organization and discipline.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

13.* Newkirk, Louis V., and Johnson, William H., The Industrial Arts Program, The MacMillan Publishing Company, New York, New York, 1947, 357 pages, $5.50.

This text is intended for those interested in the place and educational contribution of industrial arts in any of the twelve grades of both elementary and high school.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	B	D	A	A

14.* Newkirk, Louis V., Organizing and Teaching the General Shop, Charles A. Bennett Company, Inc., 1947, 200 pages, $3.50.

A large variety of actual general-shop projects are presented complete with detail drawings and instructions. Each project is analyzed for age level, equipment and materials needed.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

15.* Newkirk, Louis V., and Greene, Harry A., Tests and Measurements in Industrial Education, John Wiley and Sons, Inc., New York, New York, 1935, 253 pages, $2.75.

Presents different kinds of tests devised for the industrial arts student. The evaluation of tests, methods of giving tests, and the results to be expected are included.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	D	A	A

16.* Proffitt, Maris M., and others, Industrial Arts--Its Interpretation in American Schools, U. S. Office of Education, Washington, D. C., Bulletin No. 34, 1937.

This bulletin includes several chapters in which are discussed the origins and functions of industrial arts, industrial arts in the elementary school, junior high and senior high school.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	D	A	A

17.* Schweickhard, Dean M., Industrial Arts in Education, The Manual Arts Press, Peoria, Illinois, 1929, 367 pages, $3.00.

Written to show the place of industrial arts in modern education, this book is intended for school administrators, teachers in service and preparatory teachers.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	A	D	A	A

18.* Selvidge, R. W., and Frykland, V. C., Principles of Trade and Industrial Teaching, Charles A. Bennett Company, Inc., Peoria, Illinois, 1930, 419 pages, $2.75.

Objectives and methods, the psychology of teaching and learning, and definite procedures in teaching the grades and industrial arts. Important principles have been tested.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	D	A	A

19.* Silvius-Baysinger, Safe Work Practice in Sheet Metal Work, American Technical Society, Chicago, Illinois, 1950, 71 pages, $ .50.

Well illustrated. Preventive safety instructions attractively presented for aircraft sheet metal, metal spinning and art metal as well as the regular sheet metal courses.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	D	A	D	A	A

20.* Snedden, David, and Warner, W. E., Reconstruction of Industrial Arts Courses, Bureau of Publications, Teachers College, Columbia University, New York, New York, 1927, 143 pages, $1.30.

This book is the outcome of a summer school session at Columbia University in 1922. Much valuable aid was given by W. E. Warner who also wrote the introduction.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

21.* Struck, F. Theodore, Creative Teaching, John Wiley and Sons Publishing Company, New York, New York, 1938, 623 pages, $3.50.

A textbook covering methods of teaching industrial arts and vocational education. Shows ways of arousing interest of students, creating the desire to learn.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

22.* Vaughn, S. J., and Mays, A. B., Content and Methods of the Industrial Arts, The D. Appleton-Century Company, New York, New York, 1924, 397 pages, $2.00.

A book designed for teachers in service and prospective teachers. Gives a clear relationship between industrial education and general education.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

23.* Weaver, G. G., and Bollinger, E.W., Visual Aids, D. Van Nostrand Company, Inc., New York, New York, 1949, 388 pages, $3.50.

Shows the teachers how to make the best use of all visual aids, and how to construct their own when needed. A practical approach to the visual aids problem.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

24.* Wilber, Gordon O., Industrial Arts in General Education, International Textbook Company, Scranton, Pennsylvania, 1948, 362 pages, $3.50.

This work presents complete analyses of objectives, of industrial arts along with information on "how to plan shop work" and the best methods of teaching.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	B	A	A

25.* Williams, Walter R., Exploring the Arts and Industries, International Textbook Company, Scranton, Pennsylvania, 1940, 275 pages, $1.80.

Panoramic description of industrial developments of modern times to acquaint pupils with technical processes which affect their daily lives. Practical orientation for industry.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	B	A	B	A	A

SHEET METAL WORK

In the past sheet metal work was confined to the use of tin and galvanized iron, but in recent years aluminum, copper and other metals have been added thus increasing the interest in sheet metal work and creating many more learning situations.

Grade Level. Although sheet metal work is more often offered on the high school and college level, William J. Becker's Metalworking Made Easy, which deals with introductory metal shop projects, is based entirely upon projects to be completed on the junior high level.

Importance. "Metal work is more difficult than certain other kinds of school shopwork, and the average citizen cannot work with metals with the same freedom that he uses with other material." (1, page 30) This difficulty, however, should not exclude courses in metal work, because this type of activity has demonstrated its usefulness in meeting departmental objectives.

Offered in Oklahoma. Sheet metal work as specified courses is not reported by the industrial arts teachers in the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities for 1950 but units in sheet metal work are usually a basic part of the general metal work course and are often included in general shop organizations.

A SELECTED BIBLIOGRAPHY

1.* Bollinger, J. W., Course in Sheet Metal Work, The Bruce Publishing Company, Milwaukee, Wisconsin, 1925, 140 pages, $1.40.

Fundamentally a beginner's text presenting a through understanding of the trade through clear information and illustrations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	A	A	A	A	D

2. Broemel, L., and Daugherty, J. S., Sheet Metal Worker's Manual, Frederick J. Drake and Company, Chicago, Illinois, 1935, 541 pages, $2.00.

A complete, practical instruction manual in sheet-metal work. Includes the oxy-acelytene welding and cutting processes, with a special course in elementary and advanced sheet-metal work.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

3.* Daugherty, James S., Sheet-Metal Pattern Drafting and Shop Problems, The Manual Arts Press, Peoria, Illinois, 1922, 173 pages, $2.24.

Many typical problems, easy to apply to trade conditions. Each is illustrated with a photograph of the finished form, a full page detail drawing of the development, and step-by-step instructions.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	B	A	B	A	A

4. Giachino, J. W., Aircraft Sheet Metalwork, The Manual Arts Press, Peoria, Illinois, 1942, Part I $1.96, Part II $1.20.

Part I, the textbook, contains step-by-step information on practical sheet metalworking for beginning students. Part II, the workbook, is made up of blueprint projects.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

5. Hamilton, E. T., Tin Craft, Dodd, Mead and Company, New York, New York, 1935, 508 pages, $3.50.

Things to make out of all kinds of tin cans are presented in this book. Includes illustrations and instructions for many projects on the art of simplified tin can metal work.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

6. Kaberlein, Joseph J., Short Cuts for Round Layouts, The Bruce Publishing Company, Milwaukee, Wisconsin, 1947, 280 pages, $3.75.

A text and working guide with practical and modern methods for laying out and forming patterns for round elbows, angles, T's, offsets, tapers, cones, branches, and cyclones.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

10.* Smith, Robert E., Units in Sheet Metal Work, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1939, 48 pages, $.80.

Includes many illustrations to show correct procedures and gives related information on processes and sheet metal occupations. It gives instruction on the several machines used.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	B	A	B	D	B	D	A	C

11.* Trew, Marion D., and Bird, Verne A., Sheet-Metal Work, The Manual Arts Press, Peoria, Illinois, 1923, 64 pages, $.64.

A very elementary book the text and problem or project book. Information on materials used in sheet-metal work, scope of the work, systems of measure and measuring tools give added value.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	D	B	B	B	B	B	B	B	B	D

12.* Welch, R. L., Elements of Sheet Metal Work, The Bruce Publishing Company, Milwaukee, Wisconsin, 1926, 122 pages, $1.10.

A complete course in elementary sheet-metal work, eliminating elaborate engineering details and involved technical description. Begins with the very simplest basic problems.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	C	A	A	A	A	A	A	A	A	C

WELDING

The early uses of welding were mainly to repair or salvage worn or damaged metal equipment and metal parts. Because of the continued improvements in this area, welding has gradually replaced many casting and a great amount of riveting. The machine age has created a growing demand for the use of welding which indicated a need for welding as an industrial arts subject. The mechanization of farms has brought a new demand for the teaching of welding to farm youth. This work can be included in any small town industrial arts courses for their benefit.

Grade Level. Because of the dangers involved in the operation of welding units and the technical related information which must necessarily accompany teaching in this area, welding should be offered only to the more mature pupils. These factors would probably limit welding to the last two years of high school and to the college level.

Importance. The rapid growth of the steel industry and the extension of the use of welding as a method of steel fabrication is reason enough for the progress being made in this field. More important, however, to the offering of welding as a subject area in industrial arts in this state are the general informational values that can be obtained which may be utilized on the modern mechanized farm.

Offered in Oklahoma. Welding as a separate course has increased in the number of times offered during recent years.

7. Kaberlein, Joseph J., Triangulation Short-Cut Layouts, The Bruce Publishing Company, Milwaukee, Wisconsin, 1948, 288 pages, $5.00

Practical and modern methods for laying out and forming patterns for blower exhaust systems, heating, and air conditioning. 146 projects illustrate methods in their shortest form.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

8.* Lukowitz, Joseph J., 55 New Tin Can Projects, The Bruce Publishing Company, Milwaukee, Wisconsin, 1948, 80 pages, $1.50.

Projects for making 55 attractive objects out of discarded tin-cans, with clear directions for making them and jogs to assist in their making.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	A	A	A	A	A	C

9. Neubecker, William, Sheet Metal Work, American Technical Society, Chicago, Illinois, 1944, 360 pages, $3.00.

A volume of practical self-instruction in pattern drafting and construction work in light and heavy gage metal, including sky-lights, roofing cornice work patterns for forced air fittings, etc.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating											

This is due to two major factors: the availability of war surplus welding units which schools received without cost; and a growing demand for trained welders. Welding was listed twelve times as a named course by the Directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities. Eight of these courses are on college level.

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1.* Althouse, A. D., and Turnquist, C. H., Modern Welding Practice, The Goodheart-Willcox Company, Inc., Chicago Illinois, 1942, 412 pages, $4.00.

Prepared especially for the public schools, this book emphasizes proper techniques in welding in order that the beginner may understand and become acquainted with correct welding practices.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	B	A	B	A	B	A	D	A	A

2.* Giachino, J. W., Oxy-Acetylene Welding and Cutting, The Manual Arts Press, Peoria, Illinois, 1942, 196 pages, $1.96.

Discusses oxy-acetylene equipment, welding processes for all positions, metal identification, welding steel, cast iron, aluminum, brazing, airplane welding and flame cutting.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	B	D	C	D	B	C

3.* Giachino, J. W., Oxy-Acetylene Welding For Beginners, The Manual Arts Press, Peoria, Illinois, 1939, 96 pages, $1.29.

A complete text for beginners, this book includes all of the information needed for setting up apparatus, safety practices and explaning all the different types of joints.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	A	A	D	D	C	D	B	C

4.* Gourley, Vincent C., Welding Symbols, The Bruce Publishing Company, Milwaukee, Wisconsin, 1947, 125 pages, $2.50.

Teaches the uses and meanings of welding symbols. A short-cut method that enables the welder to accurately interpret either the simplest or the most intricate typification of the welding code.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	A	D	B	D	A	A

5.* Jennings, Charles, H., How to Weld 29 Metals, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, 1937, 103 pages, $.50.

Gives the procedures for welding twenty-nine metals and shows many different types of welding joints. Much data and detailed information is also given.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	B	B	A	D	D	C	D	B	C

6.* Lincoln Electric Company, Procedure Handbook of Arc Welding Design and Practice, The Lincoln Electric Company, Cleveland, Ohio, 1933, 1282 pages, $1.50.

Published by a leading manufactorer of electrical welding equipment, this book is one of the most up-to-date and complete in its field. Revised every two or three years.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	B	A	A	D	A	B	A	A

7.* Linde Air Products Co., The Oxy-Acetylene Handbook, The Linde Air Products Company, New York, New York, 1943, 587 pages, $1.50.

A study of the general principles of the oxy-acetylene welding process, welding ferrous alloys, non-ferrous alloys, application of oxy-acetylene cutting inspection and management.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	A	A	A	A	D	B	B

8.* Plumley, Stuart, Oxy-Acetylene and Arc Welding, University Printing Press, Minneapolis, Minnesota, 1939, 402 pages, $5.00.

Discusses oxy-acetylene equipment, welding of steel, cast iron, aluminum, lead burning, flame cutting, airplane welding, pipe welding, welding monel, nickel, copper and various alloys.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	B	B	B	A	D	B	D	B	A

9.* Potter, Morgan H., Electric Welding, American Technical Society, Chicago, Illinois, 1940, 127 pages, $1.50.

A practical text covering fundamental principles and application of the various types of electric arc welding, including use of power tube rectiviers. Discusses the various welding methods.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	B	B	D	C	D	B	C

10.* Potter, Morgan H., Oxy-Acetylene Welding, American Technical Society, Chicago, Illinois, 1940, 130 pages, $1.50.

A presentation of modern processes and techniques of welding, cutting and lead burning for steel, cast iron, aluminum, copper, brass, brazing, white metal, flame cutting, and jigs.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	A	A	A	B	D	C	D	B	B

11.* Rice, William, Fundamentals of Electric Welding, American Technical Society, Chicago, Illinois, 1943, 138 pages, $1.75.

A study of welding processes, the welding machine, electrodes, welding booth and shop, welding positions, testing welds, measuring progress, welding symbols. A well-illustrated course of operations.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	B	B	B	B	B	B	B	D	B	B

12.* Rigsby, H. P., Welding Fundamentals, Pitman Publishing Corporation, New York, New York, 1948, 179 pages, $2.75.

In addition to a discussion of all the various phases of welding this book presents a historical background of welding and its place in industry. A well-illustrated book.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	B	A	B	B	D	C	D	A	A

13.* Rossi, Boniface E., Welding and its Application, McGraw-Hill Book Co., Inc., New York, New York, 1941, 343 pages, $2.80.

A clear, understandable treatment of the different welding and cutting processes. Completely pictures the welding process, and describes methods of testing welds and interpretation.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	A	A	A	A	B	A	D	A	D	A	A

14.* Sacks, Raymond J., Theory and Practice of Arc Welding, D. Van Nostrand Co., Inc., New York, New York, 1943, 383 pages, $4.00.

Gives a complete course in both theory and practice, and follows the principles set up by the American Welding Society. Organized so that a specific skill may be taught.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	B	A	B	B	B	A	A	D	B	A

15.* Sykes, F. W., Drawing and Development of Practical Welding, Pitman Publishing Corporation, Chicago, Illinois, 1944, 72 pages, $1.00.

This study of sketching and drawing as applied to welding includes standard weld joints, and their uses, simple developments for welded construction, distortion problems and how to overcome them.

Points	1	2	3	4	5	6	7	8	9	10	11
Rating	B	A	B	B	A	B	D	C	D	B	A

CHAPTER V.

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY

In the preceding chapters a discussion of the philosophical thinking underlying the growth of industrial arts education has been given and an explanation of the proposed study has been outlined in detail. The bibliography presented in Chapter IV is the key part of the study and upon its use must necessarily be built any continued effort along this line. It is the purpose of this chapter to summarize the data offered and to make recommendations for further study in the area of Industrial Arts Libraries. These recommendations involve problems which suggested themselves as the writer worked at this study.

Summary. The "Bibliography for Industrial Arts Library" contains 262 entries. These entries involve books selected for professional reading and 15 subject matter fields. The fields surveyed and the number of books listed in each include:

Art Copper Work	14
Bench Metal Work	20
Carpentry	15
Electrical Work	15
Forging	6
Graphic Arts	15
Hand Woodworking	23
Home Mechanics	6
Industrial Finishes	6
Leather Work	15
Machine Woodworking	27
Mechanical Drawing	33
Plastics	15
Professional Books	25
Sheet Metal Work	12
Welding	15

The second problem which raises its head when any library, especially a classroom library, is suggested is, "How will it be administered?" This question involves the problems of student administration or teacher administration, of cataloguing or not cataloguing, open stacks or closed stacks. Still another problem which could not be considered within the scope of this study was: "How shall the books be acquired? Shall they be provided for in the regular library budget, paid for out of fees collected in the department, or purchased by some money raising scheme?"

A fourth problem includes such questions as how much money per pupil shall be spent each year for library books and what percentage of that spent should be set aside for industrial arts books. All these problems are recommended by the writer for further study.

Given below is a formal statement of these suggested problems:

1. A study of the physical needs of the Industrial Arts Library.
2. A study of the administrative procedure of the Industrial Arts Library.
3. The financial problems involved in the establishment and up-keep of the Industrial Arts Library.
4. The proportion of all library monies to be spent in the Industrial Arts Library.

Though this study has revealed many interesting problems which could not be included within the scope of the study, the bibliography included will prove very helpful to the writer and others in classroom teaching and the establishment of Industrial Arts Libraries.

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