

VISUAL AIDS FURNISHED BY COMMERCIAL FIRMS FOR USE
IN INDUSTRIAL ARTS CLASSES

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CHAPTER I

A PREFATORY STATEMENT OF PURPOSE

No undertaking may be called worthy without a need and a purpose to motivate the worker. Any one of the following should be reason enough to stimulate an investigation concerning the subject: a deep professional and personal interest in an unexplored field; a great professional need for the solution of a particular problem; or the apparent lack and growing need of knowledge in a vital sphere of importance. The last of these purposes seems to be the chief source of motivation in the completion of this study. The results are of such importance that the researcher should be challenged to find or invent techniques of investigations worthy of the end in view.

The Problem Stated. The title is: VISUAL AIDS FOR INDUSTRIAL ART CLASSES, FURNISHED BY COMMERCIAL FIRMS. The title might seem to leave the impression upon some who read it that all commercial teaching aids which are procurable from any and all sources are included in this study. This, however, is not the case. Only those aids which may be secured by the industrial arts teacher free or for a nominal sum are included. The writer found that, almost without exception, the commercial companies and sales organizations, who depend largely upon the

public schools as an avenue of sales for their merchandise, are willing to cooperate with the teachers to the fullest extent.

The cost of advertising is a major item in the overhead expenses of a majority of businesses today. To receive the greatest amount of advertising at the lowest cost is the problem confronting business managers. The very fact that the most progressive and thriving manufacturers and retailers are publishing free literature for the schools seems to speak for itself that this form of aid is excellent advertising.

The Purposes of the Study. The need, the importance, and the necessity of supplementary teaching materials in industrial arts departments are recognized by all who affiliate themselves with the industrial arts programs in our schools.

This study is being undertaken with the thought in mind that the material which will be included might be of considerable assistance to industrial arts teachers, foremen, supervisors, and department heads in the acquisition of supplementary commercial visual teaching aids. The study was designed for the purpose of obtaining, first-hand, the general attitude of the various commercial and industrial concerns as to the disposition of requests for free or almost free booklets, charts, samples, etc. The

newness of this study, due to the recency of the adoption of the present methods of advertising by business concerns, makes this an appropriate thesis topic. Lists of commercial teaching aids must be provided to assist the busy teacher in selecting those helpful to his peculiar needs.

The following problems which pertain to supplementary instructional materials used in industrial arts classes must be discussed because of the conditions which control the distribution of free or nearly free commercial teaching aids.

1. Create confidence in the industrial arts teacher for commercial advertisers in that:
 - a. The advertiser will fulfill his obligation to furnish material.
 - b. The materials furnished are of instructional value.
 - c. The facts contained are reliable, though only the facts substantiating arguments favorable to the advertiser are usually given.
 - d. No obligation is incurred by the inquirer.
2. Furnish to the teacher information concerning a large and varied group of commercial teaching aids as to the:
 - a. Source of supply
 - b. Quantity
 - c. Quality
 - d. Cost, if any
3. Provide greater efficiency for the teacher and

economize on his time spent in the search for commercial teaching aids.

The purposes of this study or of any investigation must be achieved in the light of a basic philosophy or under the control of stated principles. This thesis is founded on a "frame of references" which is stated as a foundation for the study.

The Frame of Reference. Industrial arts instructors have been concerned with tool and manipulative processes to such an extent that the social and economic phases of life have been neglected. The youth in our schools is being trained with little regard for the future activities of the citizen he is to be. His training, both general and vocationally, is too often not coordinated with the life work of the eighty-five per cent who discontinue their formal education at the completion of high school, or the fifteen per cent who continue their formal education beyond high school. Closer cooperation between business and industry, the schools and the citizens, is essential.

Along the general thought of integrating business, education, and the social and economic aspects of human life, Hunt has this to say: (20, page 5)

The achievement of professional and technical competency is founded on a great understanding of the material advancements of the race. This understanding must include a study of the historical achievements of civilization in the

peaceful arts through hard work, through the development of inventions and machines and through the discovery and processing of new materials. The foundations of this understanding lie in an intensive exploration of the materials of industry and the changes that man makes in them for purposes of making them more useful and satisfying. The mere study of these processes and the gaining of knowledge about the efficiency of manufacturing methods, have too often in the past, been the sole aim of engineering instruction in general and shopwork courses in particular. The ultimate effects of industrial and technical developments must be considered as significant phases of the social and economic order.

The following criteria are offered as a "frame of reference" upon which the educational implications of this thesis are based.

1. The industrial arts subjects must be taught as school subjects, but must be based on business and industrial methods, and processes.
2. The industrial arts subjects must be made flexible and adaptable enough to interest the least adept pupil yet comprehensive enough to challenge the brightest student to the utmost of his abilities.
3. The industrial arts program must fit into and be an essential part in a well-rounded program of general education.
4. Personal ethics and social efficiency are complementary attributes of education in a democracy.
5. Financially handicapped schools must resort partially to the careful and constant use of commercial visual teaching aids for improvement in subject matter attainment. The teaching aids selected must be valid, both educationally and industrially.

Limitations of the Study. This thesis includes commercial visual teaching materials that may be obtained

by industrial arts teachers free or nearly free from commercial concerns and sales organizations.

There are several reasons for not including all available sources with all available teaching aids. The first is the small available departmental budgets allowed for a majority of industrial arts teachers. A second limit is the necessity for studying a definite area of the problem that can reasonably be expected in a master's thesis. Perhaps not of least importance is the limited time and meager financial resources available to the writer of the report.

Of the hundreds of manufacturers and sales organizations who advertise in industrial arts, industrial education, and vocational education magazines, many were not considered for various reasons. Some provided teaching aids for subjects not included in the list selected for study in this thesis, others were known to have no teaching aids available, while still others covered materials not included in the limitations of this study.

The effort to classify and evaluate films for use in school shop classes is being undertaken by another student in the graduate school of the Oklahoma Agricultural and Mechanical College. The report of this study should be available soon.

Has This Problem Been Studied Before? "Manual Training" was a term used to designate the type of shop work

introduced from Russia in 1876, and exhibited at the Philadelphia Centennial Exposition. It was used for many years afterward to designate any type of shop work or mechanical drawing taught in the schools of this country. By many, in places where the nomenclature has not been kept up, it is still known by the original name. The training of the hands was the main feature of the school shop work in the beginning.

"Manual Arts" was a term introduced in 1894 with the idea that it should include not only manipulative training, but also, the ideas of utility and design of the "graphic, mechanic plastic, textile, book making and culinary arts."

"Industrial Arts" was introduced in the early years of the twentieth century to cover a still larger phase of the work being offered in the shop and laboratory. To the skill of the hand and the study of utility and beauty is added the notion of industrial or economic and social values. (16, page 3)

Such an idea has had a significant influence on the type of courses offered and on the things emphasized in the courses. It brings us a study of all the problems which arise in the converting of raw materials into finished products.

Although the current phase of industrial arts had its beginning about 1910, so far as the writer is able to find, only meager studies have been made in the direction of organized effort to use the commercial teaching helps published by manufacturing and sales organizations. The

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following publications are all that the writer has found concerning teaching aids.

Smith, Homer J., Teaching Aids for the Asking, University of Minnesota Press, Minneapolis, 1929, 62 pages, cost, fifty cents.

This is a selected, classified, and annotated list of informational booklets and teaching aids, offered free or at small cost by manufacturing and sales organizations. These 500 teaching aids are divided among industrial arts, general science, and geography.

The teaching aids for industrial arts are divided according to subjects as follows: trees and woods; general woodwork and carpentry; wood finishing and interior decoration; structural materials; drawings, plan-reading, and estimating; plumbing, heating, and ventilation; brickwork, masonry, and concrete; electricity; sheet metal; metals and metal workings; abrasives and grinding; lubrication; automobile work; printing; and miscellaneous.

Munn, Russell, National Youth Administration, Trade Books, Quoddy Village, Maine, 90 pages, no cost.

This is an annotated bibliography of books and pamphlets on certain mechanical and allied trades. The publications are selected and classified as to subject matter fields as follows: drafting; carpentry; woodwork-
ing; printing; plumbing and steamfitting; machine shop; sheet metal; welding; auto mechanics; electricity; engineering materials; general maintenance; grounds im-
provement; commercial; reproduction; cafeteria; library;

and some handy books.

Brenholtz, Robert A., "Visual Aids for the Woodworking Shop", Industrial Arts and Vocational Education, 29: 104-106, March 1940.

This magazine article gives a resume of what the instructor may do to make his job of teaching shopwork more effective. The description includes such phases of visual techniques as the use of wall charts, how to construct devices, and sources of some materials.

Definitions of Terms. In order to clarify the concepts represented by special terms used frequently in this study, the following definitions are offered. The definitions found in existing literature are given proper reference, otherwise the definitions are proposed by the writer.

Industrial Education. A general term including all educational activities concerned with modern industry, its raw materials, products, machines, personnel, and problems. It, therefore, includes both industrial arts, the general-education forerunner of, or introduction to industrial-vocational education and the latter also. (17, page 5)

Industrial Arts as a school subject may be defined as a study of the changes man makes in materials to increase their values to meet needs, of the appropriate usage of products made, and of the social advantages and problems resulting from making of these changes and products. (7, page 2)

Trade and Industrial Education includes those forms of vocational education the direct purpose of each of which is to fit the individual for some industrial pursuit or trade. (32, page 547) (This term is usually used when referring to subsidized Smith-Hughes courses.)

Commercial Visual Teaching Aids. This term is applied to all instruction booklets, pamphlets, models,

samples, charts, etc., furnished by manufacturing and sales organizations.

Vocational Education. A specialized education leading to direct entrance into a vocation.

General-Education. Fitting the individual for life in general, acquainting him with means for sustaining life, and forming a foundation for subsequent selection and specialization.

Manual Arts. This is a term that was introduced in about 1894 for the old manual training program. It carried with it the idea that the program should include, not only manipulative training, but also the ideas of utility and design of the "graphic, mechanical plastic, textile, book making and culinary".

Manual Training. This is a general term applied to all type of shopwork done in the schools following the advent of the Russian system of teaching shopwork into this country about 1876, until about 1896.

Some Desirable Ultimate Uses of This Study. The writer expects abstracts of this study to be made available in bulletin form to teachers of industrial arts in Oklahoma. If this is done, the following uses of the material might be made.

1. The development of a better professionalized attitude on the part of the industrial arts teachers toward commercial advertisers.
2. Providing a source of supply for industrial arts

teachers when teaching aids are needed.

3. Improvement of instruction in industrial arts through stimulated use of commercial visual teaching aids.

The Next Step in the Study. With the problem stated, it is perhaps best to build a foundation for the use of commercial visual teaching aids by a discussion of general education and industrial arts and their connection with this study. These topics will be discussed in Chapter II.

CHAPTER II
A PHILOSOPHY OF GENERAL EDUCATION
AND INDUSTRIAL ARTS

The term philosophy seems very remote to many people who do not understand its real meaning. It is conceived as something beyond the grasp of the imagination. We should not attempt to avoid the word, for it is not so formidable after all. Bawden, in his discussion of the philosophy of industrial arts, defines it thus: (6, page 178)

....The love of wisdom, as leading to the search for it; hence, knowledge of general principles, as explaining facts and experiences.

Without philosophy there is little growth. The day-dreamer may be a philosopher if his dreams have background or possible solution. A philosophy of a subject is a conception formulated on the possible solution of the problem.

A PHILOSOPHY OF GENERAL EDUCATION

The long experiences of man are not to be wasted. The more substantial the background of experience connected with an abundance of thought and reason on the part of the one who formulates the philosophy, the more sound will be the philosophy set forth. The recorded history of past inventions, experiences, literatures, etc., saves each

succeeding generation the drudgery, time, expense and labor of redoing them. There seems to be little truth in saying that man has profited by past experiences of war, greed, and hate, yet in the word of constant endeavor toward an education above the past, man has gone on and on. It is through the educational systems that he has learned to record the experiences of past individuals and societies. He has attempted to profit by these experiences.

The great question of each generation is just what shall be passed on to the succeeding generation to insure its existence, preservation, and continuance.

The Development of General Education. Among the peoples of the early civilizations it became apparent that there was a necessity for the education of the time to have a division between that of the body and that of the mind. Even in the early time of the Greeks, the (29, page 255)

....conception of citizenship was sufficiently broad, however, to comprehend that men of action as well as men of wisdom should be educated in the cultivation of certain so-called virtues desirable for every citizen. The fundamental education accepted as essential for all came to be known as liberal education.

Centuries passed and little advancement was made in this art of liberal education started so long ago. The schools of the early modern period began to expand, yet the devotees of liberal education were jealous of its prerogatives. (29, page 257)

At this stage of educational history the development of centuries came to a rather well-defined climax which prepared the way for ushering in the still further accomplishments of more recent years. The whole idea of a general education had been born and had grown to maturity, and had been coupled with the long-established cultural education....

In a publication of current interest, on a community-centered education in the modern high school, Everett does not mention general education by name as his objective, but indicates it very thoroughly. He writes as follows: (15, page 303)

One of the major jobs in the core curriculum would be to make a study of society to determine vocational opportunities, to learn more about the social and economic maladjustments which are severely limiting these opportunities, and to study the proposed ways of bettering this economic situation....

The core curriculum would require that students spend a considerable proportion of their time in becoming familiar with the many vital aspects of the community life. The local, state, national, and international community would be studied....

Mr. Everett continues in the direction of general education when he points out that the new type of school building would be constructed with facilities for caring for the educational needs of the adults and children alike. (15, page 307 and 308)

....By and large, the children would make use of such facilities during the day. Adults would make use of them in the evenings. Libraries, laboratories, art studios, workshops,....would be provided....

So far, only a suggestion as to the meaning of

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general education has been given. It seems appropriate now to discuss further the term and its real meaning.

Definition of General Education. General education should be planned and conducted in such a way as to be of benefit to all normal persons. It has an enormous spread of possibilities. Fitting an individual for life in general is a huge undertaking, but to do more is almost unreasonable, yet that is what faces general education. Concerning general education Schweickard says: (30, page 264)

....general education, besides fitting the individual for life in general and acquainting him with means for sustaining life, performs the further function of forming the foundation for subsequent selection and specialization. Finally, it gives way to specialization when the choice has been made. In contrast with vocational education, general education is accepted as being beneficial to general intelligence and general improvement, and in that sense is considered a necessary prerequisite and a desirable adjunct to vocational education.

Continuing along the same line of thought that it is the duty of the school to serve the needs of all instead of the special interests of each, Mursell has written the following that substantiates this very well. (26, page 100)

Now the school stands to serve the interests, not of each but of all. It is not training some to be machinists, and others to be carpenters, and others to be physicians, and others to be home makers, and others to be politicians. It is educating human beings, so that, within the limits of their capacity, they may enter effectively into any or all the relationships of life. This cannot

be done by imparting a tremendous repertoire of specialized tricks, but only by giving a broad grasp of the intellectual resources of civilization as the agencies for enlightening livingit seeks to make men better business men, and engineers, and farmers, by making them more effective human beings....It stands, as we have seen, for a general culture in the sense of a foundation for a common way of life. But it must go one step further. It must seek to make culture practical, by having the pupil acquire it in close relationship to the great business of living.

Mursell sums up the whole thing by saying that the school must assume a constructive responsibility in selecting from the whole range of possible educational experiences those of most worth, in thinking through and planning education as the foundation of a general rather than a special way of life, and in seeking to produce a flexible, creative, progressive social adjustment by rightly imparting the significant elements from the array of our intellectual resources.

Current Trends in General Education. With the years of joblessness and financial unrest has come a veil of suspicion over the schools. Until just recently, the achievements brought about through the educational system satisfied the laymen to a fair degree. Social changes are necessarily bringing about similar changes in the school curriculum. More questions are being asked concerning all philosophies. Fewer theories are taken for granted. More thinking is being done individually. Although important, this age of questioning everything

sometimes borders on the field of skepticism. This tinge of skepticism is shown in the fact that the fundamentals of the Great Teacher are being questioned as we have not known before.

Behind this economic unrest lie social maladjustments. This deeper thinking has brought about a search for greater general knowledge in the subject-matter fields. A more fundamental background for specialization is aimed for. These generalizations are, according to Ashley:

(3, page 77)

....one of the most significant educational moves of the time.

The general courses are defended because of their adaptability to pupil backgrounds and interests and because of an information spread pertinent to twentieth-century living that was not possible where curriculums were limited by name. Where the subject-matter spread is broad, pupil interest is said to be greatly stimulated and the learning rate accelerated.

A great danger lies in wait when the "general" system is inaugurated, however, because of the confusion brought about by the too often half-hearted efforts of the teacher-specialist. The teacher-specialist is confused because he considers the whole situation a mess. His efforts are half-hearted because he is confused. He sees no general laws that will cover the whole field of history, science, mathematics, woodwork, or drawing. However, when he finds that subject-matter is not lost

sight of, and that the manner of presentation is broadened to align itself with the social needs to give greater opportunity for student stimulus and response he learns that the system is not one worked out by an ignoramus. The program is child-centered.

Those who have recently graduated from college will have little of the confusion faced by the specialist. To him the word "general" is a way of doing a thing. It is a method. Ashley, in his discussion of general education puts it this way. (3, page 179)

As for the 1940 graduate who chose to prepare for teaching, he will have had such direction in his college work that he will think in terms of basic course teaching from the beginning if adolescents are to be his concern. His undergraduate preparation will include work representing fifty per cent of his effort in the subject-matter areas of his field while his graduate work will make sure he understands philosophy and method. To him the "general" is the only way and anything else is ridiculous.

The so-called "general" teacher in any area needs but recognize that it is his purpose to select from the subject-matter areas of his fields those materials which not only are interesting to the pupil, because of his background of knowledge--his maturity level--permits him to understand, but which will be most useful to him as incentives and as bases for more knowledge in the field....

Thus the new general education gives the pupil a non-specialized view of many areas of a subject-matter field. He is able to see the dependence of one area upon another. His interests in one area may be keyed to the point of specialization later. Specialization is not

done away with, but is approached by a thorough background of generalizations.

Definite Objectives of General Education. Variations in the philosophies of leading thinkers of the country concerning the objectives and methods of approach to special objectives of general education are ever existent. However, a great many leaders agree with Schmidt when he says: (28, page 227)

If our aim is general education in nature, the pupil should be the starting point for the selection of projects, activities, and course content. If, as Kilpatrick says, "education is actually life desirably carried on with ever more conscious intent to improve itself as it goes", then the school must become a place where such actual life situations may be experienced. Strickler says that: "Individual personal growth is an inclusive term that contains everything that all the previously mentioned objectives mean...."

The Education Policies Commission recommend the following as objectives to be attained in general education for economic well-being. They are: (14, pages 33-74)

1. Education should develop broad social intelligence on economic problems.
2. Education should aim at better understanding of industrial relations.
3. Development of cooperative attitudes tends to increase economic well-being.
4. Education should further raise the level of general mechanical competency.
5. Education should further encourage scientific competency.
6. Higher education should aid the public in studying basic economic problems.

7. The economic contributions of education at early age levels should be further developed.
8. The schools should give greater attention to the education of the consumer.
9. Modern conditions make intelligent consumption difficult.
10. Consumer education and cooperation are essential in modern economy.
11. Quantity production and advertising permit a higher standard of living for the masses.
12. The educated consumer possesses high standards of value and taste.
13. Education is needed for wiser purchasing and consumption of food.
14. Education is needed for wiser expenditure for clothing.
15. Education is needed for wiser purchasing of shelter.
16. Education is needed for wiser purchase of health.
17. Education is needed for better discrimination in avocational expenditures.
18. There is need for better understanding of the significance of public expenditures.
19. Education is needed for wiser saving.
20. Consumer education has its technical phases.
21. The educated consumer is sensitive to his social responsibilities.

With a knowledge of the philosophy and the definite objectives of general education, and with a familiarity of the use of the word philosophy as a background it seems almost necessary to discuss the philosophy and objectives of industrial arts to complete the line of thought whose general trend from general education was toward industrial arts.

PHILOSOPHY OF INDUSTRIAL ARTS IN EDUCATION

Industrial arts in the education system of America had its beginning about the middle of the last half of the nineteenth century in the form of manual training. Dr. Calvin M. Woodward, Engineering Department, Washington University, St. Louis, and President J. D. Runkle, Massachusetts Institute of Technology, were among the men who led the movement of manual training in the United States. Immediately following Washington University and Massachusetts Institute of Technology, or almost simultaneous with them, the University of Illinois, and Steven's Institute were among the schools to introduce this new method of education.

(34, page 28)

The Centennial Exposition at Philadelphia in 1876 gave immediate stimulation to the development of this new movement. From Russia came Victor Della-Vos to the exposition to display his own logical order of teaching the Russian system of manual training. (34, page 28) Coupling the Russian system of manual training and the interest aroused by it with the ideas and interest already prevalent in America, a great impetus was given to the movement on a broad scale, until, out of that movement has evolved the present industrial arts program.

Definitions of Industrial Arts. Manual training in the beginning, received great support from those who held

to the faculty psychology idea. Although almost every psychologist has now abandoned the theory of transfer of training, the new industrial arts is considered a definite part of complete growth. The character of an individual is expressed fully in the cycle of activities which are developed in the planning, and construction of a project. The planning and execution of the plans in the form of construction are characteristic of the industrial arts program. No other department in school is able to carry these out so naturally and fully as the industrial arts department. The aim of every good school is to guarantee, so far as possible, an opportunity for maximum growth at all times. As an aid to this growth it is possible for industrial arts to have a great part. Wilbur, discussing adolescent development and industrial arts, says: (37, page 244)

....Industrial arts must be broad in its coverage of industrial materials, processes, and products, and its organization must be flexible if the needs of all boys and girls are to be reasonably met.

Bawden is very gracious, yet stern, in his appraisal of industrial arts in the education system as follows:

(5, page 18)

In a school which does not maintain an industrial arts department, means for insuring complete and all-round growth of the individual are generally lacking, and it may even be questioned whether this objective is consciously set up in such a school.

Someone raises the question as to how the student is aided in attaining this all-round growth. We refer again

to Bauden who gives his point of view as to the breadth of the possibilities leading from the industrial arts courses. (5, page 18)

Industrial arts makes an important contribution to the growth of the individual by leading out to new fields of inquiry and study, and to a broader outlook. Working with wood may suggest a study of forestry, and lead to an understanding of the relation of forests to water sheds, erosion, and agriculture; observation of the properties of iron and steel in the metal-shop may develop interest in the amazing application of chemistry in industry; experiences in the school drafting-room may subsequently influence the planning of a home; and so on. Thus to open the windows of the mind to new vistas, to new adaptations and applications of knowledges, skills, and data acquired, is part of the process of "freeing or releasing the human spirit".

It was about a score of years after the turn of the twentieth century that this new meaning was placed upon the manual arts movement, and it came to be termed "Industrial Arts". With this new name, industrial arts, increasing responsibilities were heaped upon it. To the original meaning which included utility and design were added the social and economic problems that arise while changing a product into a more useful article for society. This increased emphasis on the social and economic aspects of the problem has reduced the extent to which the skills are stressed. This is expressed more fully by Bonser when he says that industrial arts is:
(7, page 2)

A study of the changes man makes in materials to increase their values to meet needs, of the appropriate usage of products made, and of the social advantages and the problems resulting from the making of these changes and products.

Current Trends of Industrial Arts. In a preceding discussion a more or less general history of industrial arts has been presented. Current problems and trends and a very limited forecast from a common basis will be considered. In order that a common basis may be established from which to work, a further definition of industrial arts will be given here. For consideration, the definition by the Ohio State Committee and quoted by Moore will be used. (25, page 137)

Industrial arts is one of the practical arts, a form of general, or non-vocational education, which provides learners with experiences, understandings, and appreciations of materials, tools, processes, products, and of the vocational conditions and requirements incident generally to the manufacturing and mechanical industries.

These results are achieved through design and construction of useful products in laboratories or shops, appropriately staffed and equipped, supplemented by readings, investigations, discussions, films, visits, reports, and similar activities, characteristic of youthful interests and aptitudes in things industrial.

The subject of industrial arts, while encompassing all age and school levels, is justified in secondary-school areas for such purpose as exploration, guidance, the development of avocational and vocational interests and aptitudes, specific manual abilities, desirable personal-social traits growing out of industrial products wisely--all coupled with the aesthetic relationships involved. In general,

its purposes are educationally social rather than vocationally economic, although in the senior high school it may increasingly emphasize vocational objectives in a non-legal sense, for certain students.

Based on the idea that learning is greatest where the interest is greatest, industrial arts will surely be developed in the elementary school of the future, (25, page 137)

....or some other field will take up this development and do the type of work which we should be doing.

There are many economically maladjusted homes in which the child cannot be expected to be continually interested in the printed page. Thus is necessitated the stimulus of purposeful activity which permits emotional outlet, physical expression, mental development and an outlet for the imaginative impulses. Thus is provided the satisfaction which only a job carried to completion can bring.

With the increasing load placed on the teacher must come the use of the available instructional material, especially charts, photographs, pictures, models, pamphlets, booklets, periodical publications, catalogs of supplies and equipment, demonstration materials, information sheets, instruction sheets, and slides and motion pictures.

Coming more and more into popularity is the delegation of certain powers by the instructor to organized student personnel. (25, page 139)

....With larger classes and more areas to be covered in a given shop, organization becomes a paramount issue for every teacher. He must set up some sort of fundamental organization that makes it possible for him to be a teacher rather than just a checker.

Better industrial arts libraries tend to give greater application of the social and economic phases and general knowledge aims of the subject. Social and economic changes have been comparatively rapid during the past few years and: (23, page 358)

Present-day education must not only be in accord with democratic principles but it must provide the student with a vision of better social order and the training which will assist him in attaining it....

Another of the demands heaped upon the industrial arts department is that for a better correlation of beauty and art in the shop projects. In writing of the trends of industrial arts education, Moore has the following to say:

(25, page 139)

....We must have correlation of beauty and art in our industrial arts projects. They will be simpler in design....

There will be a distinct trend toward more modern, but not modernistic furniture. This new modern furniture will be plain, well designed, and above all, have utilitarian value.

....Smaller projects will require less equipment and not nearly so much storage space in our shops.

....It seems to me we must choose things which boys want to make....

His interest may not be furniture--it may be toys, puzzles, boats, airplanes, sleds,

scooters, wagons, or something with hobby possibilities which we may not have thought of at all.

Hobbies are those things which one can't wait to do. They are things with which one is occupied during moments of leisure. Therefore, the hobby is an interest, and you must make it part of your thinking in terms of industrial arts.

As we consider further the trends of the philosophy of industrial arts in education we are reminded by Warner that the following are clearly typical. (35, page 9)

Shop teaching in the American schools has passed or is passing through three more or less general stages of evolution, starting from their beginning:

- a. Manual training.....1876
- b. Manual arts.....1894
- c. Industrial arts.....1910

Evidences of all of these are to be seen in various schools. Some schools still emphasize training the hands in a high degree of skill on abstract exercises as typified by the term Manual Training. Others, and possibly these are in the majority at present if the use of terms in Ohio is any indication, have changed the emphasis on skill and abstract hand work to projects that involve more utility and design. This change to the growing interest in design, and to the increasing interest in shopwork or manual arts as the "educational" subject is easily traced to the influence of Otto Salomon at Naas, Sweden, and to Gustaf Larsson in the Sloyd Training School of Boston which was established in 1888....

A BRIEF SUMMARY OF THE TREND OF INDUSTRIAL ARTS

<u>Items Compared</u>	<u>Early Practices</u>	<u>Modern Trends</u>
1. Terms used	Manual training, sloyd, arts and crafts, manual arts.	Industrial arts, practical arts.

<u>Items Compared</u>	<u>Early Practices</u>	<u>Modern Trends</u>
2. Types of shop or laboratory.	Wood shop generally, also metal shops.	General and unit shops, boy life, excursions, industry, and the home. A growing boy or girl.
3. Core of the teaching situation.	Subject matter, (wood to be shaped).	A growing boy or girl.
4. Materials and activities.	Chiefly wood, making models and joints as prescribed.	Any available industrial material; activities of observation, construction, recreation, investigation, experimentation, and evaluation.
5. Objects or goals.	Training, skill and transfer. "The skillful hand, the cultured mind."	Better choosers and users of industrial products. Better attitude toward industry and its products. Exploration for "Guidance".
6. Emphasis placed on,	Manipulation, handwork, skill, learning, keeping busy.	Activities (see 4 above) Outcomes judged by habits, knowledges, appreciations, attitudes, skills, abilities.
7. Establishments of curriculum materials; their selections and organization.	Stated series of exercises; technical and logical.	Projects that "challenge". Activities selected in response to exigence of the situation--arising out of a "present day" setting--psychologically organized and treated.

<u>Items Compared</u>	<u>Early Practices</u>	<u>Modern Trends</u>
8. Class or laboratory method used.	Based on doctrine of formal discipline. Logical steps, dictated directions.	Experiences in real situations with as many real industrial products and occupations as possible.
9. Results functioning in,	A great deal of certain types of skill and some culture.	Desirable differences in conduct, abilities, habits, knowledges, and industrial skill.
10. Elements causing change.	Exhibits at the Centennial Exhibition; opinions of prominent men.	Changing of industries, changing sociological, psychological, economic, philosophical, and physiological facts and teachings. Measuring results in objectives, and criteria based on above. Research.

The foregoing statements by Mr. Warner bear out the fact that less skill emphasis is given and more emphasis is placed on the industrial or economic and social values or education.

Definite Objectives of Industrial Arts. In a broad sense the terms philosophy and objectives are synonymous. As society changes and progresses the philosophies change but very little basically. The same definite goal is usually sought. Only the means of attaining this goal are varied. Thus the objectives of a constant movement seldom vary. But industrial arts is not constant, as to the in-

clusion of the subject-matter. The field is broadening. With the increased scope must come the broadening of the field of objectives. The objectives of industrial arts today are much more inclusive than at the beginning of the century.

An attempt is made to quote objectives which will meet the needs of the present program and satisfy the apparent trend of industrial arts.

Warner, in his book on the policies of industrial arts education, after a thorough discussion trial by his "jury", has settled on the following objectives for junior high school industrial arts: (35, page 44)

1. General guidance.
2. Further exploratory and avocational opportunities.
3. Vocational preparation for a specific industrial vocation.
4. Consumers' or utilizers' knowledges and appreciations of the products of industry.
5. Formation of desirable personal and social habits.
6. Development of a degree of skill with tools and in tools or machine processes commensurate with the ability of the pupil and the incidental to the completion of the project or activity which seems to have "educational" values.

In the mind of the writer a discussion of the objectives of industrial arts would hardly be complete without including those adopted by Selvidge to be obtained in a good industrial arts program. (5, pages 36-48)

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

2. To develop in each pupil the ability to select wisely, care for, and use properly the things he buys or uses.
3. To develop in each pupil an appreciation of good workmanship and good design.
4. To develop in each pupil an attitude of pride or interest in his ability to do useful things.
5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or unfamiliar situation.
6. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.
7. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.
8. To develop in each pupil the habit of careful, thoughtful work without loitering or wasting time. (industry)
9. To develop in each pupil an attitude of readiness to assist others when they need help, and to join in group undertakings. (cooperation)
10. To develop in each pupil a thoughtful attitude in the matter of making things easy and pleasant for others.
11. To develop in each pupil a knowledge and understanding of mechanical drawing, the interpretation of the conventions in drawings and working diagrams, and the ability to express ideas by means of a drawing.
12. To develop in each pupil elementary skills in the use of the more common tools and machines in modifying and handling materials, and an understanding of some of the more common construction problems.

With the philosophies and objectives of both general education and industrial arts in mind it seems appropriate for a discussion of the contributions that this study will make to both general education and industrial arts.

HOW THIS STUDY CONTRIBUTES TO BOTH GENERAL EDUCATION
AND INDUSTRIAL ARTS

An unfortunate situation has arisen which has, in the minds of most people at least, separated the visual aids of the instructional materials from the more commonly used teaching materials of the classroom. In order that a better understanding of the place of visual aids in school instruction may be had by the reader, four principles of the use of visual teaching aids written by Hoban, Hoban, and Zisman, in their book on visual education in the school curriculum are reproduced. They are: (19, page 260-267)

- A. Correlation with other Teaching Materials. The first principle of the use of visual aids is this: that they should be correlated with other teaching materials. In the organization of this book the authors have recognized the danger of treating visual aids by types. Under such treatment a pattern of experience is developed in which each aid is treated as separate and distinct from the other aids. In classroom procedure, however, this situation should not obtain. One does not assemble a school museum and throw pictures and textbooks out the window. Neither is one illiterate after seeing a motion picture. School journeys, museum materials, pictures, charts, books, discussion, thinking, generalizing, applying, functionalizing, all fit together in the process called learning.
- B. Correlation with the Curriculum. Correlating visual aids with the curriculum is a second principle--and one frequently overlooked. More commonly than is suspected on first thought is the practice of using visual aids of one sort or another simply because they happen to be available.
- C. Testing with Visual Aids. Generally speaking, visual aids have been used more for teaching

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than for testing purposes. Yet, in many ways, visual aids are better tests of a fundamental type of learning than are verbal tests.

Visual aids furnish a concrete, pictorial type of experience. They contribute to the development of understandings, to the enrichment of experience, and to concrete pictorial imagery. On the other hand, unless provision is made specifically, they do not contribute to the verbalization of this experience. Now, verbal material such as is provided in textbooks, discussion, reading, etc. tends to develop verbal facility. When results are measured verbally, only the verbal experience is sampled. While verbalization, generalization, etc. are ends in themselves, the vital objective is meaningful verbalization, generalization, etc. The ability to recognize verbal statements as true or false, or to select the correct phrase from several choices, does not necessarily indicate that the pupil knows the meaning of these statements or will apply this meaning to another and new situation.

- D. Community of Experience. A final consideration in the use of visual aids, which has been omitted in the treatment of the various types, is their usefulness in providing a common experience for any group of children. Educators have been so busy trying to provide for differences among children that they have overlooked the necessity of providing for a community of experience which will do much to overcome the distressing problem of individual differences.
1. Children differ not only in native abilities: they differ in the amount and kind of experience....The difference between dull and bright children, so called, lies in their ability to achieve the higher levels of abstraction. But dull and bright alike must pass through the identical stages of development from the concrete to the abstract.
 2. The important consideration, at the moment, is the provision of a common background of

experience which will help to level the vast differences among pupils in the classroom. The variation of previous experience may be overcome to a surprising extent through the provision of concrete experience by the use of visual aids. In this way there is a community of experience established. The dull child will be furnished the experience which makes an abstract symbol--a word--have meaning to him, and the bright child will be furnished the experience which will give content to a symbol which he is capable of handling more as a symbol than he could as a symbol of a content of experience.

Visual aids are one technique. They provide a common, concrete experience out of which meaning develops and upon which may be built the progressive levels of development which lead to the attainment of those aims education has set for itself.

All the foregoing comes to this: (26, page 330-336)

Thought always begins in one way--the sense of a problem arising out of experience....

To solve this problem, Clark says: (26, page 330-336)

....Let us learn how to do it in the only way we humans learn anything--by understanding the principle involved....

So our very starting point, in teaching pupils to think, is to give them something to think aboutsomething which arises out of their own experience, and confronts them with the inescapable feeling of a genuine problem....

Hursell continues to say that education is the reconstruction of experience, the putting of more and more meaning into the concerns of activities of everyday life. These experiences must not start with the remote, the

strange, the unfamiliar, but must start with the more concrete. For example, there are, in industrial arts; models, charts, samples, etc., that bring about these real life experiences to the individual.

No one can fully appreciate the use of these concrete examples for the use of portraying real life experiences unless he understands what has caused them to be used, what they really are, etc. These topics will be discussed more at length in the following chapter.

CHAPTER III
PHILOSOPHICAL BACKGROUND OF TEACHING
BY USE OF VISUAL AIDS

With the increasing complexities of life came improved ways of interpreting and mastering situations as they arose, until the formal educative agencies of society were brought into being. To this educative agency, called the school, has fallen most of the responsibility of interpreting life and life's situations to those who come in contact with it. As these problems become doubly acute, it is necessary for the use of keener insight in order to understand and appreciate the environment in which we live.

According to Dorris, two of the most discussed of the important factors of educational, as well as industrial and commercial life, are "efficiency in work" and "economy of time". (13, page 3)

....Hence there is need of finding as many effective service agencies as possible to increase the efficiency of the teaching process. Among these agencies is to be listed whatever increases the appeal and clarifies the matter to be mastered, for such an agency aids economy and thus frees time for other efforts.

In his discussion of efficiency and economy, Siepert expresses an identical view: (5, page 101)

....Economy and efficiency are promoted through the use of commercially prepared sheets of these types.

On the same subject Dorris continues: (13, page 24)

The present is in many ways an experimental period in education, a transitional period, a period of break-

ing away from the traditional ways of teaching in order to build up new and more effective discipline and training wherewith better to meet the needs of a broadening current life. Widening possibilities require a forward-looking educational program, and teachers and other educators are ever seeking new and better ways and means of improving and enriching the teaching procedure. It is a serious thing, however, to experiment hastily or unwisely with little children, nor do educators today need to do so. Modern education is scientific: its procedure is based on psychological principles. The educational value of any new advice or method is not determined by mere opinion or theory, but must meet the test of scientific investigation. The great educational movements of the last few years, the motivation of school work, the problem and project methods, educational measurements, and the like were based on accepted pedagogical and psychological principles. These have fairly stood the tests of science and have greatly increased the efficiency of teaching.

Modern educators are now considering the merits of another new classroom procedure. It is popularly known, for lack of a better term, as "visual instruction". This is one of the most widely discussed subjects in the field of education today, not only in America, where hundreds of schools are being equipped with up-to-date apparatus for the more efficient use of visual materials, but also in nearly every enlightened country of the world....

Since, we are told by scientists, we receive about eighty-five per cent of our learning through our seeing facilities, perhaps a definition of the term "visual aids" will be in order.

Visual Aids Defined. To many people visual aids are the use of motion pictures to portray an idea or illustrate something beyond verbal description. Hoban, Hoban, and Zisman say: (19, page 9)

....To be sure, motion pictures are valuable visual aids, but they are by no means the only visual aids available to the classroom teacher, nor are they the ones most widely used in current school instruction....On the contrary, the motion picture and the lantern slide are just a few of the many visual aids available.

Continuing the discussion on visual aids other than motion pictures, Struck is very positive in his statements when he says: (33, page 230)

Objects, models, and specimens are essential aids to effective and efficient teaching. Good planning consists in anticipating their use and in using them appropriately, in having them on hand when needed, and in selecting each kind of aid with discrimination and in using it wisely.

Another worth-while form of aid is what is known as a process display, one showing various steps in the manufacture of a given article, such as an auger bit, a hand saw, or a drop forging for an automobile. Sometimes such displays also show the raw materials from which the finished product is made.

After considering all the foregoing examples of visual aids, the list of which is not complete, a more concrete definition will be considered. Hoban, Hoban, and Zisman have arrived at a definition which seems complete in every detail. Quoted, it reads as follows: (19, page 9)

A visual aid is any picture, model, object, or device which provides concrete visual experience to the learner for the purpose of (1) introducing, building up, enriching, or clarifying abstract concepts, (2) developing desirable attitudes, and (3) stimulating further activity on the part of the learner.

Before the learner can make the most effective use of

visual aids, as defined above, the problems of visual instruction must be viewed with the proper perspective by the administrator from at least two angles: with respect to the mental development on the one hand and with respect to the objectives of education on the other. These may be approached through certain psychological principles which apply to the values and use of visual aids.

Visual Aids and the Psychology of Learning. Man's reflective processes are dependent upon his background of experience. Because of this the earlier years of childhood and youth must be devoted largely to acquiring new, vivid, realistic impressions. A clear and definite, abstract thought process depends upon the definiteness of these early impressions.

Hoban, Hoban, and Zisman (19, page 16) state that original behavior is highly integrated, that the organism responds to stimuli as a whole. The same authors in the following paragraph continue:

Through the course of experience, differentiation of response develops out of a total unitary response. This differentiation is not limited to the gross bodily movements but is observable throughout the entire range of child behavior.... Psychological objects are differentiated out of their environment as they attain significance to the child through his needs.

....Through some common element or elements the various differentiated patterns of response become integrated into a higher order of reaction. Thus through the process of integration of differentiated concrete experiences that type of reaction is developed which is known as ab-

straction and generalization. The abstraction or generalization attains a richness or meaning to the extent that concrete experience is wide and varied, and to the further extent that this wide and varied concrete experience becomes integrated into a higher order of relationships.

Hoban, Hoban, and Zisman, say further that it is possible to progress, as in vocabulary content from word to word, because we are human beings, and that symbols are necessary because all language is symbolic, yet it is all relatively meaningless unless it grows out of concrete experience. Visual aids supply the concrete experience by which differentiation between symbols becomes possible. They supply the background which makes higher integration possible. This in turn leads to generalizations of the highest form that are the outgrowth of meaningful relationships among a wide variety of experiences.

Visual aids have not reached the peak of efficiency which most people believe they are capable. Hoban, Hoban, and Zisman have developed four general principles with respect to the use of visual aids in the classroom. They are: (19, pages 22-25)

A. The value of visual aids is a function of their degree of reality. In other words, visual aids are effective in instruction to the degree they approach reality of experience. Conversely, the more they are removed from reality of experience, the more ineffective they are....Without this realism, the visual aid may not only fail to achieve its end of correct imagery, but it may further result in wrong information.

B. The value of visual aids is a function of the nature and extent of the pupils' previous experience. If varied experience has already developed wide and manifold differentiation and integration from the concrete through the intermediate levels of experience to the meaningful use of words (verbalization), further visual aids are unnecessary for the development of progressive abstraction....as each previous level has been developed out of the preceding levels of experience, visual aids more and more removed from objective reality may be used to advantage.

C. The value of visual aids is a function of the objectives of instruction in the particular classroom situation....

If teachers will first determine the objectives of instruction, they can then determine whether visual aids will contribute toward the attainment of this objective and which particular visual aid lends itself best toward this end.

D. The value of visual aids is a function of the intellectual maturity of the learner.... The amount of concrete experience and its relative degree of concreteness vary widely in use between the "bright" and the "dull" pupil. The "bright" individual makes more and better differentiation in any given concrete experience. He sees relationships much more quickly. It follows, then, that the amount and concreteness of the visual aid necessary to the development of any given level of abstraction is greater where the intellectual maturity of the learner is lower, and vice versa.

The same authors conclude the discussion of visual aids and the psychology of learning by saying that materials and methods of instruction must be provided in accordance with the psychological differences of the children. The provisions for individual differences are generally quantitative, whereas they should and must be qualitative.

Inherent Danger to be Faced in the Use of Commercial Visual Aids. Although motion pictures are barely mentioned in this treatise, it is felt that the discussion which is to follow, written especially for motion pictures, will fit any and all types of commercial visual teaching aids.

Adams discusses the falseness that is sometimes presented of the views of industrial affairs through advertising. He says that: (1, pages 59-61)

Most informational films are vested with a commercial rather than an educational character. "Industrials" are primarily advertising films, though they range from careful, unbiased studies of industrial techniques to blatant claims for some particular product or concern. In point of numbers they represent more than two-thirds of the so-called educational films, providing a most profitable business for the producers of informational motion pictures.

Despite the commercial character of industrial films, the facts remain that they are being widely used at present for educational purposes.

Even when conducted on a high plane of literal accuracy, advertising merely throws light on a selected number of facts favorable to the advertiser. To present a well-rounded picture of industry as a social phenomenon is no part of its function.

Though there are organized agencies that are attempting to control films and keep the prospective users informed concerning the completeness or the one-sidedness of the details, little is actually being accomplished. Because of the pliability of the mind of the child and the adolescent boy or girl, it is very significant that no misleading or

false statements are presented or portrayed, or even insinuated.

Perhaps Adams is a bit harsh in his statements concerning the advertisers, yet there is a great element of truth attached to them, and significance should be placed according to the best judgment of the reader as he approaches the next section of this work.

To further substantiate the theorem that teaching aids are good, many of the leading distributors of these materials can be cited, but for convenience only, just one will be quoted here. J. L. Meredith, Sales Promotion Department, Henry Disston & Sons, Incorporated, in a recent letter of June 27, 1940, says:

The charts are excellent helps in school work when displayed in the manual training room. "The Saw, Tool, and File Manual" contains valuable information on the use and care of various saws and tools.

To obtain maximum results from these teaching aids it is necessary for the instructor to know what ones are available, how they may be obtained, and the general contents of each. The next chapter is devoted to answering such inquiries.

CHAPTER IV
AN ALPHABETICAL ANNOTATED LISTING OF EVALUATED COMMERCIAL
VISUAL TEACHING AIDS AND THEIR SOURCES, CLASSIFIED
AS TO INDUSTRIAL ARTS SUBJECTS

The listing of teaching aids includes a great amount of material which is available to the industrial arts teacher. It is felt that a great deal of time and effort may be saved in securing teaching aids if the listing of companies in this chapter are examined before the order is placed.

Methods of Securing Teaching Aids. The first step in securing teaching materials was to make a listing of companies which, it seemed, might furnish such items as could be used in this study. In making this list of names of companies, it was necessary to examine the advertising sections of many professional and trade magazines. From these advertisements, companies were selected because of the title of the company or because of what was contained in the advertisement.

With the listing of the companies completed, it was necessary to write each a letter. A copy of the same letter was sent each company asking for such teaching aids as they might have available for distribution. This letter is reproduced in Appendix B of this thesis.

Although only one hundred ten letters were sent out, more than two hundred replies were received. This situation

resulted from the fact that many companies forwarded to other companies several copies of the original request. In Appendix C of this thesis may be found an alphabetical list of all companies cooperating in the study in any way. Those companies sending teaching aids suitable for listing in this chapter are indicated by the asterisk. (*)

Rating of Commercial Teaching Aids. Each teaching aid listed in this chapter is described in an annotation and a rating is given to each example. The ratings are as objective as is reasonably possible in this situation. The ratings of the various publications are objective in that the rating chart was used as a basis for rating the individual items. The ratings are subjective in so far as the validation of the rating chart is concerned and in that the different articles were rated only by the person preparing this report.

The rating chart used in this study is reproduced on page forty-seven of this thesis. It is self-explanatory and is designed for the purpose of rating any commercial teaching aid with the possible exception of certain models and samples, and in these a great many parts of the chart may be followed in determining their worth as a teaching device.

How this List can be used by Industrial Arts Teachers. In Appendix C will be found an alphabetical list of the companies and advertising organizations who responded to

inquiries for commercial teaching aids. All who answered seemed willing to cooperate, but only those marked with an asterisk (*) provided materials included in the list of commercial teaching aids.

The individual annotations and ratings of each separate teaching aid should be of value to the teacher who is contemplating their use. All this information gives the teacher a better understanding of the contents of each item and whether it is usable in the situation in question. Too, this list furnishes an avenue of direct communication with those who are interested in industrial arts and industrial arts problems and their solution through the use of commercial teaching aids if such solution is probable.

The commercial visual teaching aid material is classified as listed to industrial arts subjects. The division of industrial arts subject matter into separate subjects was planned by the State Advisory Committee for industrial arts in Oklahoma Schools, of which Dr. DeWitt Hunt, Oklahoma Agricultural and Mechanical College, is chairman.

RATING SHEET USED IN THE EVALUATION OF COMMERCIAL
VISUAL TEACHING AIDS

DIRECTIONS: When rating any teaching aid the relative value is indicated by placing a check in the column to the right of the items on which the material is rated headed by A, B, or C, in which the A represents excellent, B, good, C, fair and usable. If the material contained only advertising, it is rated X. After each item is checked, the average rating may be checked at the bottom of the sheet. This average rating is indicated at the end of each discussion of each teaching aid in this chapter.

Items on which material is rated.	Rating			
	A	B	C	X
The material is valuable for direct student instructional purposes.	:	:	:	:
The material is valuable to the teacher for supplementing lectures.	:	:	:	:
The advertising matter is held to minimum.	:	:	:	:
The material is illustrated with interesting pictures or drawings.	:	:	:	:
The information is general.	:	:	:	:
The material is well written.	:	:	:	:
The material is easily read.	:	:	:	:
The material is interesting and to the point.	:	:	:	:
The material contains information which fills an often occurring need.	:	:	:	:
The material is well printed.	:	:	:	:
The material is easily obtainable.	:	:	:	:
The material is obtainable in quantities.	:	:	:	:
TOTAL	:	:	:	:
AVERAGE RATING	:	:	:	:

ART METAL WORK

ABRASIVE PRODUCTS, INC., SOUTH BRAintree, MASSACHUSETTS.

Coated Abrasive Papers and Cloths, forty pages, heavy paper binding, general catalog, illustrated, free. Rating X and B. This catalog contains tables and other specifications with prices of material of interest to shop teachers. The discussions of the different kinds of abrasives in the front of the book is valuable for classroom use.

Advertising, Spring 1940, eleven pages stapled together, Rating X.

In this advertising are shown correct ways of doing many things of interest to the woodworker.

Sandpaper, eight pages, stapled together, mimeographed, free. Rating A.

This treatise on sandpaper is very thorough in its discussion of abrasive papers and cloths. Its origin, trade names, uses, and symbols used in grading are discussed rather fully. This is a very good aid to have wherever sandpaper is used.

AMERICAN HANDICRAFTS COMPANY, LOS ANGELES, CALIF.

Catalog of Craft Supplies, indexed, seventy-five pages, free. Rating X.

Pewter, folder in six pages, no charge. Rating A. This folder contains definite instructions for peening, spinning and turning simple pewter articles. Very useful for beginners in the late elementary grades or high school.

Suggested course of study work sheet samples, 8½ x 11, mimeographed, no charge. Rating A. These worksheets are very valuable for work in etching, cold bent wrought iron, beaten art metal, iron finishes, etc.

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages, free. Rating X.

The books listed are fully annotated.

ART METAL WORK (Continued)

✓
CROWN SPRAY GUN MFG. CO., LOS ANGELES.

New Airflo Portable Painting Outfits, single folder of eight pages. Rating X.

✓
Crown Spray Guns, single folder of six pages. Rating X. These advertising folders describe the spray painting very effectively. They are printed in colors.

✓
THE DEVILBISS COMPANY, TOLEDO, OHIO.

A B C of Spray Painting Equipment, thirty-two pages, heavy paper cover, price twenty-five cents, (usually sent free on request). Rating A.

This booklet contains practically all of the common questions and answers pertaining to the operation, use, care, and adjustment of spray painting equipment. It is in answer to many requests for a simple booklet which would provide the ground work for a general understanding of all the basic principles involved. The questions selected were chosen from hundreds which have been repeated time and time again at the DeVilbiss Training School and at numerous clinics....(From the foreword of the booklet itself).

✓
GARDINER METAL COMPANY, CHICAGO

✓
How to Solder Perfectly, twelve pages, heavy paper binding, no charge. Rating A.

This booklet is devoted, as the name indicates, to how to solder. The proper steps in soldering and many suggestions should be of great value to the worker.

Gardiner Solder, sample, 1 lb. net, resin-core, no charge. Rating X and A.

Gardiner Solder, sample, 1 lb. net, acid-core, no charge. Rating X and A.

✓
KESTER SOLDER COMPANY, CHICAGO.

✓
Facts on Soldering, brochure, thirty-three pages, manilla binding, no cost. Rating A.

This brochure will be of great value in the general shop or the metal and sheet metal shop. It is illustrated and is written in large-sized type.

ART METAL WORK (Continued)

Kester Acid-Filled Solder, two sticks, six inches.

Kester Plastic Resin-filled Solder, two sticks, six inches.

THE MANUAL ARTS PRESS, PEORIA, ILLINOIS.

Books, seventy-two pages. Rating X.

This bulletin lists books suitable for texts or supplementary material in industrial education, drawing and design, shop work, home workshop, art crafts, elementary school arts, and home economics.

AUTOMOBILE MECHANICS

ABRASIVE PRODUCTS, INC., SOUTH BRAIRTREE, MASS.

Coated Abrasive Papers and Cloths, forty pages, heavy paper binding, general catalog, illustrated, free. Rating X and B. This catalog contains tables and other specifications with prices of material of interest to the buyer. The discussions of the different kinds of abrasives in the front of the book is valuable for classroom use.

Advertising Spring 1940, eleven pages stapled together, free. Rating X.

In this advertising are shown correct ways of doing many things of interest to the woodworker.

Sandpaper, eight pages, stapled together, mimeographed, free. Rating A.

This treatise on sandpaper is very thorough in its discussion of abrasive papers and cloths. Its origin, trade names, uses, and symbols used in grading are discussed rather fully. This is a very good aid to have wherever sandpaper is used.

ABRASIVE ENGINEERING CORPORATION, DETROIT, MICHIGAN.

Grade-O-Meter, a catalog folder, six pages, free. Rating X and B.

This catalog folder is helpful concerning the grades of grinding wheels.

AUTOMOBILE MECHANICS (Continued)

The Grade-O-Meter and Its Functions, 6 x 7 explanation sheet concerning the grading of grinding wheels by use of the Grade-O-Meter, free. Rating X and B.

Grade-O-Meter, single advertising sheet 8 x 11, free. Rating X.

The Grade-O-Meter Now at a Popular Price, catalog, four pages, free. Rating X.

A Preventable Profit Leak, booklet, paper binding, ten pages, free. Rating B.

This booklet contains discussions of the grains and bonding substances of grinding wheels.

What Do You Know About Grinding Wheels? booklet, paper binding, eight pages, free. Rating B.

This little booklet contains information in it on the texture of grinding wheels and what to look for when selecting grinding wheels.

E. C. ATKINS AND COMPANY, INDIANAPOLIS, INDIANA.

Atkins Grinding Wheels, Standard List Prices and General Information, sixteen pages, free. Rating X.

✓ Atkins Hacksaw Blades, folder of eight pages, free. Rating X.

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X. The books are fully annotated.

THE CARBORUNDUM COMPANY, NIAGARA FALLS

Wheel Gradings for all Classes of Grinding, seventy-nine pages, light cardboard binding, free. Rating X and A.

This booklet is designed for the purpose of teaching the buyer some of the important factors influencing the selection of grinding wheels. Grading tables and tables of grinding wheel speeds are published to aid the buyer.

AUTOMOBILE MECHANICS (Continued)

"Aloxite-TP" Modern Polishing Practice, twenty-four pages, free. Rating X and B.

This is an electrically fused alumina made for use in the polishing shops. This manual points out the best practices for setting up modern abrasives. The appendix gives five pages of handy data for the polisher.

Mounted Wheels, Twenty-four pages, attractively illustrated, free. Rating X and A.

This booklet is a catalog of facts and illustrations concerning high speed grinding machines. Useful in the machine shop, glass and pottery plants, and tire and rubber plants.

Tool Room Grinding, 132 pages, table of contents, free. Rating A.

This book on tool room grinding is an attempt to bring to the grinding wheel user a better understanding of grinding wheels and their relation to the various operations of tool sharpening and miscellaneous grinding performed in the tool room. The drawings, photographs, and tables show the various machines, typical tool set-ups, and the results that should be obtained through each correct grinding.

Carborundum and Aloxite Brand Grinding Wheel Catalog, about 158 pages, book form. Rating X.

This book describes a complete line of grinding wheels, insert teeth, disc wheels, dressers, and whet stones.

The Abrasives in the Service of Industry, by Frank J. Tone, President of the Carborundum Company, eighteen pages, free. Rating B.

This pamphlet contains a description of the present abrasives used in industry. The narrative "Abrasives in the Service of Industry" is more or less a chronological description of the evolution of abrasives.

The Romance of Carborundum, nineteen pages, pamphlet, free. Rating A.

This pamphlet is a printed story of the history of carborundum. The story is very well written and very interesting.

Grinding Wheels, ten page folding pamphlet, free. Rating X. The title gives a full indication of the contents of this pamphlet.

AUTOMOBILE MECHANICS (Continued)

Jointer and Sharpening Stones by Carborundum for the Woodworking Trade, eight page folding pamphlet, free. Rating X.

Coated Abrasive Products for all Purposes, sixty-eight pages, free. Rating B.

The contents of this booklet are very well explained by the title, but it also contains several pages of directions for splicing cloth and paper abrasive belts.

+ HENRY DISSTON & SONS, INC., PHILADELPHIA

Disston Hack Saw Chart, printed, 14 x 18½, no charge. Rating A. This wall chart will be helpful in the machine shop, or wherever the hack saw is used. The thin paper background requires a frame for class use.

File Chart, printed, 19 x 25, no charge. Rating A. Twelve common files, their uses and care are listed and pictured on this wall chart. This chart requires a frame for maximum life.

GENERAL MOTORS CORPORATION, DETROIT.

Transportation Progress, fifty-three pages, slick paper binding, free. Rating X and B.

This booklet is the history of self-propelled vehicles from earliest times down to the modern car, reprinted from The Turning Wheel, The Story of General Motors Through Twenty-five Years, 1908-1933, by Arthur Pound.

When The Wheels Revolve, twenty-two pages, heavy paper binding, well illustrated, free. Rating A.

This pamphlet is a description of the operation of the automobile from the pistons to the rear wheels, using familiar objects from the home and office to illustrate the principles involved.

Diesel the Modern Power, thirty-one pages, heavy paper binding, free. Rating A.

This booklet is profusely illustrated, and discusses the past, present, and future of the Diesel motor.

AUTOMOBILE MECHANICS (Continued)

Modes and Motors, thirty-two pages, heavy paper binding, illustrated, free. Rating A.

This booklet tells us how automobiles, accessories and other products are designed in the designing section, with a brief outline of the development of artistic principles from the dawn of history.

Putting Progress Through Its Paces, thirty-two pages, heavy paper binding, free. Rating A.

This is an absorbing book describing tests made at General Motors proving ground. It is really "a photographic trip behind the scenes with a proving ground engineer."

Research Looks to New Horizons, thirty-two pages, heavy paper binding, free. Rating A.

This booklet tells us about a trip through a modern research laboratory, together with something about the origin of research, what it has done and what it holds for the future.

Metallurgy and Wheels, forty-eight pages, light cardboard binding, free. Rating A.

This profusely illustrated booklet contains the story of iron and steel from prehistoric times, with special attention to the part these metals play in the automobile industry.

Chemistry and Wheels, twenty-four pages, illustrated, heavy binding, free. Rating A.

This booklet tells the fascinating story of the combustion of gasoline in an automobile engine, treated from the standpoint that the motor car is a chemical factory on wheels.

Electricity and Wheels, thirty-two pages, heavy paper binding, illustrated, free. Rating A.

This booklet gives a review of the outstanding milestones in the history of electrical progress, together with an explanation of the "how" and "why" of the various electrical units used in the automobile.

CHEVROLET MOTOR DIVISION, GENERAL MOTORS CORP., DETROIT.

Chevrolet 1940 Shop Manual, 282 pages, heavy paper binding, free. Rating X and A.

This book is, as named, a shop manual. The information in this shop manual covers a brief description of construction,

AUTOMOBILE MECHANICS (Continued)

and thorough data on operation, care, specifications, and overhaul of the various units of the 1940 Chevrolet passenger cars and trucks. A "Service News Reference" memorandum space is provided at the end of each chapter for notes on additional information that might accumulate.

*NICHOLSON FILE CO., PROVIDENCE, R. I.

File Philosophy, brochure, forty-eight pages, heavy paper binding, free. Rating A.

This brochure contains a short history of the file, some safety precautions in the use, handling, and care of the file, hints regarding the proper methods of using files and the various applications of the most common files. It contains several illustrations.

Nicholson Files and Rasps and X. F. Swiss Pattern Files, sixty-four pages, illustrated, indexed, paper binding, free. Rating X.

A File for Every Purpose, twenty-five page booklet, heavy paper binding, free. Rating A.

This booklet is written for aiding in the use and care of files. Fine illustrations of handling and using the file for many and varied purposes are given.

*NORTON COMPANY, WORCESTER, MASS.

Crystaldon and Diamond Wheels for Grinding Cemented Carbide Tools, Forty-four pages, heavy paper binding, illustrated, free. Rating X, and B.

This well illustrated booklet is very well described by its name.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

AUTOMOBILE MECHANICS (Continued)

Norbide, thirteen pages, pamphlet, no charge. Rating X. This pamphlet deals with the "hardest material ever produced by man for commercial use."

Abrasive Papers & Cloths for the Student and Home Craftsman, booklet, thirty-two pages, no charge. Rating X and B. This booklet describes and illustrates how the Norton abrasive papers and cloths are made and used.

Norton Grinding Wheels for the Petroleum Industry, folder of twelve pages. Rating X.

Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A. This brochure is illustrated and contains much specific as well as general information on selection of grinding wheels.

✓ How to Sharpen, forty-seven pages, booklet, heavy paper binding, no charge. Rating A. This booklet is excellent for aiding in the selection of stones, sharpening chisels, knives, scissors, razors, lawn mowers, augerbits, etc., with illustrations of the strokes needed for the best results.

Abrasives Their History and Development, twenty-seven pages, heavy paper binding, free. Rating B. This booklet is very well explained by the title.

Facts About Metal Polishing, thirty-nine pages, booklet, heavy paper binding, free. Rating X and B. This booklet will prove helpful in the metal shops. The finishing of many sorts of metal is touched upon.

Correct Wheels Required for Grinding the Cutting Carbides, eight pages, free. Rating B. This pamphlet is one on grinding practices for best results from the grinding wheels.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, single sheet doubled, heavy paper, free. Rating X. (Illustrated)

AUTOMOBILE MECHANICS (Continued)

Grinding Wheels, general catalog, twenty-seven pages, free. Rating X.

Superfinishing with Norton Machines, Stones and Wheels, single sheet folder of six pages, free. Rating X.

Kerosene Lubrication now used for Norton Wheel Spindles, four page folder, free. Rating X.

Grits and Grinds, about twelve pages, published twice a year, free. Rating A.

This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

STANDARD OIL COMPANY (INDIANA), CHICAGO.

The Lubrication Engineer....his value to You, eight pages, illustrated, free. Rating X and A.

This bulletin, though put out in the interests of the Standard Oil Company, contains some very vital points that should be known and observed by all who operate machinery.

ELECTRICITY

BRYANT ELECTRIC COMPANY, BRIDGEPORT, CONN.

Bryant Superior Wiring Devices, Catalog No. 40, indexed, classified in groups for convenient selection, loose leaf binding, 116 pages, free. Rating X and C. Though this catalog is mainly a picture display of electric devices, it contains several pages of aids in electric wiring pertaining to symbols, placements of outlets, suggestions for residence wiring, etc. The line of electric accessories is very complete.

Bryant Hospital Signal Devices and Equipment, twelve pages, drawings of typical hospital layouts. Rating X.

BRUCE PUBLISHING CO., MILWAUKEE, WISCONSIN

ELECTRICITY (Continued)

Bruce School Books, general catalog, seventy pages. Rating X.
The books listed are fully annotated.

HENRY DISSTON & SONS, INC., PHILADELPHIA.

How to Use Handsaws for Crosscutting, Handsaws for Ripping, printed, 19 x 25, no charge. Rating A.
This wall chart is very practical, a great time saver, and visual aid of significance. It should be framed for best service from the light paper.

GARDINER METAL COMPANY, CHICAGO.

How to Solder Perfectly, twelve pages, heavy paper binding, no charge. Rating A.
This booklet is devoted, as the name indicates, to how to solder. The proper steps in soldering and many suggestions should be of great value to the worker.

THE MANUAL ARTS PRESS, PEORIA, ILLINOIS.

Books, seventy-two pages. Rating X.
This bulletin lists books suitable for texts or supplementary material in industrial education, drawing and design, shop work, home workshop, art crafts, elementary school arts, and home economics.

NATIONAL CARBON CO., NEW YORK.

The Inside Story of a Flashlight Battery, eight pages, free. Rating X and B.
This booklet is described by its name.

Weather as a Hobby, forty-four page booklet, heavy paper binding, free. Rating A.
This booklet is interesting with practical suggestions for the beginning or amateur weatherman. Otherwise, the title suggests the contents of the booklet.

ELECTRICITY (Continued)

The History of Portable Light in America, twelve pages, free. Rating A.

This booklet is written in an interesting manner with many illustrations of the types of lamps used from the time of Columbus to the present time.

Fun with Dry Batteries, ninety-six page booklet, ten cents, five cents in quantities. Rating B.

This booklet is excellent for the amateur electrician and beginner. It contains simple principles of electricity, practical things to make, and is well illustrated.

RADIO WIRE TELEVISION INCORPORATED, NEW YORK.

Catalog No. 80, Lafayette Radio, free. Rating X. 120 pages.

This catalog contains a complete line of radios, automobiles, and cabinet radio accessories, amateur equipment, generators, and electric phonographs.

WESTINGHOUSE ELECTRIC & MFG. CO., PITTSBURGH, PENN.

Guide Book, 1940 National Rural Electrification Contest, twelve pages, free, illustrated. Rating B.

This book is published to give the possibilities of the use of electricity in rural areas. Irrigation, home equipment, electricity in the country, dairying aids, etc., are discussed in the light of the possibilities for greater efficiency with the use of electricity.

How to Make a Toy Electric Motor, eight pages, illustrated, free. Rating A.

This pamphlet contains full instructions, including pictures and drawings for the construction of a toy electric motor.

FOUNDRY

ABRASIVE ENGINEERING CORPORATION, DETROIT, MICHIGAN.

Grade-O-Meter, a catalog folder, six pages, free. Rating X and B.

This catalog folder is helpful concerning the grades of grinding wheels.

FOUNDRY (Continued)

The Grade-O-Meter and its Functions, 6 x 7 explanation sheet concerning the grading of grinding wheels by use of the Grade-O-Meter, free. Rating, B.

Grade-O-Meters, single advertising sheet, 8 x 11, free. Rating X.

The Grade-O-Meter Now at a Popular Price, catalog, four pages, free. Rating X.

A Preventable Profit Leak, booklet, paper binding, ten pages, free. Rating B.

This booklet contains discussions of the grains and bonding substances of grinding wheels.

What Do You Know About Grinding Wheels? booklet, paper binding, eight pages, free. Rating B.

This little booklet contains information on the texture of grinding wheels and what to look for when selecting grinding wheels.

* BUFFALO FORGE COMPANY, MACHINE TOOL DIVISION, BUFFALO, N. Y.

General Catalog, 194 pages, free. Rating X.

Exercises for Forge Shop Practice, twenty pages, printed, manilla folder backs, loose leaf, free. Rating A.

This folder is very good for forge shop classes, as the name indicates. The exercises are numbered, illustrated and give stock needed, explanation, operation, and cautions.

NORTON COMPANY, WORCESTER, MASS.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

FOUNDRY (Continued)

Norbide, thirteen pages, pamphlet, no charge. Rating X. This pamphlet deals with the 'hardest material ever produced by man for commercial use'.

Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A. This brochure is illustrated and contains much specific as well as general information on selection of grinding wheels.

Facts About Metal Polishing, thirty-nine pages, booklet, heavy paper binding, free. Rating X and B. This booklet will prove helpful in the metal shops. The finishing of many sorts of metal is touched upon.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, single sheet doubled, heavy paper, free. Rating X. (Illustrated)

Grits and Grinds, about twelve pages, published twice a year, free. Rating A. This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

OSBORNE MFG. COMPANY, CLEVELAND.

Osborne Moulding Machines, permanent binder, loose leaf style, complete catalog, 175 pages, imitation leather binding, free. Rating X.

Fundamentals of Core Blowing, twelve pages, pamphlet, free. Rating B. This pamphlet concerns itself with the importance of the core blowing machine and its operation.

PYOTT FOUNDRY & MACHINE CO., CHICAGO.

A Pictorial Description of the Methods used at the Pyott Plant, fourteen pages, neat and attractive binding and illustrations, free. Rating X and B. This booklet is a pictorial and word description of the plant.

FOUNDRY (Continued)

STERLING WHEELBARROW CO., WEST ALLES, WISCONSIN.

Catalog No. 49, forty-eight pages, illustrated, free. Rating X.

This catalog advertises special steel foundry flasks, wheelbarrows, flask pins, wedges and contractor's carts.

GENERAL METAL WORK

ABRASIVE ENGINEERING CORPORATION, DETROIT.

Grade-O-Meter, a catalog folder, six pages, free. Rating X and B.

This catalog folder is helpful concerning the grades of grinding wheels.

The Grade-O-Meter and its Functions, 6 x 7 explanation sheet concerning the grading of grinding wheels by use of the Grade-O-Meter, free. Rating B.

Grade-O-Meters, single advertising sheet 8 x 11, free. Rating X.

The Grade-O-Meter Now at a Popular Price, catalog, four pages, free. Rating X.

A Preventable Profit Leak, booklet, paper binding, ten pages, free. Rating B.

This booklet contains discussions of the grains and bonding substances of grinding wheels.

What Do You Know About Grinding Wheels? booklet, paper binding, eight pages, free. Rating B.

This little booklet contains information on the texture of grinding wheels and what to look for when selecting grinding wheels.

AMERICAN HANDICRAFTS CO., LOS ANGELES.

Catalog of Craft Supplies, Indexed, seventy-five pages, free. Rating X.

GENERAL METAL WORK (Continued)

Pewter, folder in six pages, no charge. Rating A.
This folder contains definite instructions for peening, spinning and turning simple pewter articles. Very useful for beginners in the late elementary grade or high school.

Suggested course of study work sheet samples, 8½ x 11, mimeographed, no charge. Rating A.
These worksheets are very valuable for work in etching, cold bent wrought iron, beaten art metal, iron finishes, etc.

AMERICAN STEEL AND WIRE COMPANY, CHICAGO.

Making Steel and Wire, forty pages, illustrated, free. Rating A.
This booklet deals with the history of steel and wire, the mining of the ore, and the actual making of the products themselves. The booklet is well illustrated, with pictures, drawings and graphs of the processes gone through in the manufacture of these products.

Chart of American Wire Nails, chart, 20½ x 49, free. Rating A.
This wall chart is designed to give a complete knowledge of the various types of nails, spikes, staples and tacks. More than eighty different kinds of these various fasteners are illustrated--half actual size.

E. C. ATKINS AND COMPANY, INDIANAPOLIS, IND.

Atkins Grinding Wheels, Standard List Prices and General Information, sixteen pages, free. Rating X.

Atkins Machine Knives, Grinding Hints, General Information, sixteen pages, free. Rating X and B.
This bulletin gives several pages of hints on grinding and sharpening of knives and blades. Very helpful suggestions are contained in the booklet.

BUFFALO FORGE CO., MACHINE TOOL DIVISION, BUFFALO, NEW YORK

GENERAL METAL WORK (Continued)

General Catalog, 194 pages, free. Rating X.

Exercises for Forge Shop Practice, twenty pages, printed, manilla folder backs, loose leaf, free. Rating A. This folder is very good for forge shop classes, as the name indicates. The exercises are numbered, illustrated and give stock needed, explanation, operation, and cautions.

BUCK BROTHERS, MILLBURY, MASS.

Catalog and Price List, Edge Tools and Carving Tools, fifty-two pages, heavy paper binding, free. Rating X. This catalog lists a complete line of wood chisels, cold chisels, carving tools, draw knives, etc.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

Wheel Gradings for All Classes of Grinding, seventy-nine pages, light cardboard binding, free. Rating X and A. This booklet is designed for the purpose of teaching the buyer some of the important factors influencing the selection of grinding wheels. Grading tables and tables of grinding wheel speeds are published to aid the buyer.

"Aloxite-TP" Modern Polishing Practice, twenty-four pages, free. Rating X and B. This is an electrically fused alumina made for use in the polishing shops. This manual points out the best practices for setting up modern abrasives. The appendix gives five pages of handy data for the polisher.

Mounted Wheels, twenty-four pages, attractively illustrated, free. Rating X and A. This booklet is a catalog of facts and illustrations concerning high speed grinding machines. Useful in the machine shop, glass and pottery plants, and tire and rubber plants.

Tool Room Grinding, 132 pages, table of contents, free. Rating A.

GENERAL METAL WORK (Continued)

This book on tool room grinding is an attempt to bring to the grinding wheel user a better understanding of grinding wheels and their relation to the various operations of tool sharpening and miscellaneous grinding performed in the tool room. The drawings, photographs, and tables show the various machines, typical tool set-ups, and the results that should be obtained through each correct grinding.

Carborundum and Alexite Brand Grinding Wheel Catalog, about 158 pages, book. Rating X.

This book describes a complete line of grinding wheels, insert teeth, disc wheels, dressers, and whet stones.

The Abrasives in the Service of Industry, by Frank J. Tone, President of the Carborundum Company, eighteen pages, free. Rating B.

This pamphlet contains a description of the present abrasives and their use in industry. The narrative "Abrasives in the service of industry" is more or less a chronological description of the evolution of abrasives.

The Romance of Carborundum, nineteen pages, pamphlet, free. Rating A.

This pamphlet is a printed story of the history of carborundum. The story is very well written and very interesting.

Grinding Wheels, ten page folding pamphlet, free. Rating X. The title gives a full indication of the contents of this pamphlet.

Jointer and Sharpening Stones by Carborundum for the Woodworking Trade, eight page folding pamphlet, free. Rating X.

Coated Abrasive Products for all Purposes, sixty-eight pages, free. Rating B.

The contents of this booklet are very well explained by the title, but it also contains several pages of directions for splicing cloth and paper abrasive belts.

*CINCINNATI TOOL COMPANY, CINCINNATI, OHIO.

GENERAL METAL WORK (Continued)

Catalog No. 106, clamps, chisels, punches, drills, and anvils, twenty-one pages, free. Rating X and C. This booklet contains only a few items of educational interest. Two of these are the tests given clamps, page seven, and the tests given chisels, page eighteen.

Hargrave Folder, chisels, punches, and drills, four pages, free. Rating X and B.

This folder contains enlarged drawings of the shapes of the points of different chisels, and a photograph of how to use a star hand drill. This will be valuable wherever tool work is done.

THE COLORADO FUEL AND IRON CORP., DENVER.

Colorado Copper Bearing Nails, printed tin, 13 $\frac{1}{2}$ x 19 $\frac{1}{4}$, no charge. Rating A.

This wall chart will be very helpful in all woodworking classes, general shop classes and farm shop classes. The tin background makes for long life. The nails are beautifully arranged in deep colors, making the chart very attractive. Every nail from the common brad to the flat head diamond point spike is pictured.

HENRY DISSTON & SONS, INC., PHILADELPHIA.

Disston Saw, Tool and File Manual, forty-six pages, slick paper back, no charge. Rating X and A.

This brochure is more than a catalog. It contains very valuable information on the selection, care and use of the file, saw, and other tools. The information is given at the very beginning of the separate discussions. This will prove valuable in every shop where saws, files and other tools are used.

Disston Hack Saw Chart, printed, 14 x 18 $\frac{1}{2}$, no charge. Rating A.

This wall chart will be helpful in the machine shop, or wherever the hack saw is used. The thin paper background requires a frame for class use.

GENERAL METAL WORK (Continued)

File Chart, printed, 19 x 25, no charge. Rating A.
Twelve common files, their uses and care are listed and
pictured on this wall chart. The chart requires a frame
for maximum life.

GARDINER METAL COMPANY, CHICAGO.

How To Solder Perfectly, twelve pages, heavy paper binding,
no charge. Rating A.
This booklet is devoted, as the name indicates, to how to
solder. The proper steps in soldering and many suggestions
should be of great value to the worker.

R. G. HASKINS COMPANY, CHICAGO.

Haskins Portable Flexible Shafts Machines, forty pages,
illustrations, highly colored, neat bindings of heavy
paper, complete line, free. Rating X.
The title partially describes the contents of this catalog.
The flexible shafts permit drilling, grinding, etc. to be
done in irregular places.

JOHN HASSELL, INC., BROOKLYN, NEW YORK.

Catalog, twenty-two pages, no charge. Rating X and B.
This catalog is a general catalog, but there are so many
named illustrations of nails, rivets, screws, and bolts
that it is worth a great deal as an illustration for use
of the various pictures.

KESTER SOLDER COMPANY, CHICAGO.

Facts on Soldering, thirty-three pages, manilla binding,
no cost. Rating A.
This brochure will be of great value in the general shop or
the metal and sheet metal shop. It is illustrated and is
written in large-sized type.

THE MANUAL ARTS PRESS, PEORIA, ILLINOIS.

GENERAL METAL WORK (Continued)

Books, seventy-two pages. Rating X.

This bulletin lists books suitable for texts or supplementary material in industrial education, drawing and design, shop work, home workshop, art crafts, elementary school arts, and home economics.

NATIONAL LEAD COMPANY, ST. LOUIS.

Pewter, single sheet doubled into six pages, no cost.

Rating A and X.

This sheet contains three full pages of instructions, illustrations, and drawings for projects to be made of pewter. It also contains a short history of pewter.

Dutch Boy Painter Magazine, about 20 pages, published bi-monthly, in the interest of better painting, free to painters and paint dealers. Rating X and A.

This magazine, besides the commercial value to the painter, contains many suggestions on painting and answers to painting problems. This is good for the school boy, and the shop.

NATIONAL TWIST DRILL & TOOL CO., DETROIT, MICHIGAN.

General Catalog, 312 pages, imitation leather binding, free.

Rating X and A.

This book contains, other than the regular line of tools handled by the company, more than 100 pages of tables, rules, etc. that are very useful in the machine shop.

Metal Gauge for shaping drill points, reamers, hobs, milling cutters, and special tools, free. Rating A.

This gauge will prove to be a very excellent aid in sharpening the tools named above.

NICHOLSON FILE COMPANY, PROVIDENCE, R. I.

File Philosophy, brochure, forty-eight pages, heavy paper binding, free. Rating A.

This brochure contains a short history of the file, some safety precautions in the use, handling, and care of the file, hints regarding the proper methods of using files and the various applications of the most common files. It contains several illustrations.

GENERAL METAL WORK (Continued)

Nicholson Files and Rasps and X. F. Swiss Pattern Files, sixty-four pages, illustrated, indexed, paper binding, free. Rating X.

A File for Every Purpose, twenty-five page booklet, heavy paper binding, free. Rating A.

This booklet is written for aiding in the use and care of files. Fine illustrations of handling and using the file for many and varied purposes are given.

NORTON COMPANY, WORCESTER, MASS.

Crystaldon and Diamond Wheels for Grinding Cemented Carbide Tools, forty-four pages, heavy paper binding, illustrated, free. Rating X and B.

This well illustrated booklet is very well described by its name.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

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Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A.

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GENERAL METAL WORK (Continued)

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This booklet is excellent for aiding in the selection of stones, sharpening chisels, knives, scissors, razors, lawn mowers, augerbits, etc., with illustrations of the strokes needed for the best results.

Abrasives Their History and Development, twenty-seven pages, heavy paper binding, free. Rating B.

This booklet is very well explained by the title.

Correct Wheels Required for Grinding the Cutting Carbides, eight pages, free. Rating B.

This pamphlet is one on grinding practices for best results from the grinding wheels.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, single sheet doubled, heavy paper, free. Rating X.

Grinding Wheels, general catalog, twenty-seven pages, free. Rating X.

Superfinishing with Norton Machines, Stones and Wheels, single sheet folder of six pages, free. Rating X.

Grits and Grinds, about twelve pages, published twice a year, free. Rating X.

This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

THE SKYBRITE COMPANY, CLEVELAND, OHIO.

Specifications for the Surface Treatment, Protection and Maintenance of Architectural Aluminum, eight pages, free. Rating B and X.

These specifications give condensed and authoritative data on the production, protection and maintenance of finishes for architectural aluminum, an alloy of pure aluminum.

GENERAL METAL WORK (Continued)

WALLACE SUPPLIES MFG. CO., CHICAGO.

The Wallace Benders, Catalog, No. 32A, about 110 pages, free, loose leaf binding type. Rating X. These bending machines are well illustrated with pictures of the work actually done.

WHITE METAL (PEWTER) ROLLING & STAMPING CORP., BROOKLYN.

History of Pewter, ten pages, mimeographed, free. Rating A. These mimeographed leaves stapled together contain more than the history of pewter. They contain four pages of projects to be made from pewter, and the instructions for constructing.

HOME MECHANICS

ABRASIVE PRODUCTS, INC., SOUTH BRAIRTREE, MASS.

Coated Abrasive Papers and Cloths, forty pages, heavy paper binding, general catalog, illustrated, free. Rating X and B. This catalog contains tables and other specifications with prices of material of interest to the buyer. The discussions of the different kinds of abrasives in the front of the book is valuable for classroom use.

Advertising Spring 1940, eleven pages stapled together, free. Rating X.

In this advertisement are shown correct ways of doing many things of interest to the woodworker.

Sandpaper, eight pages, stapled together, mimeographed, free. Rating A.

This treatise on sandpaper is very thorough in its discussion of abrasive papers and cloths. Its origin, trade names, uses, and symbols used in grading are discussed rather fully. This is a very good aid to have wherever sandpaper is used.

AMERICAN STEEL AND WIRE CO., CHICAGO.

Chart of American Wire Nails, chart, 20 x 40, free. Rating A. This wall chart is designed to give a mental knowledge of the

HOME MECHANICS (Continued)

various types of nails, spikes, staples and tacks. More than eighty different kinds of these various types are illustrated--half actual size.

E. C. ATKINS AND COMPANY, INDIANAPOLIS, INDIANA.

Saw Sense, forty-eight pages, paper binding, free. Rating A. This booklet contains ten pages of directions for caring for saws, four pages of valuable information to the everyday carpenter, ten pages of job sheets, and three pages of carpenter's table of wages. It will be very valuable in the woodworking shop.

Atkins Hacksaw Blades, folder of eight pages, free. Rating X.

The Demonstration Saw, it clearly shows the different types of teeth used in handsaws and the two types of handsaws commonly used. They are loaned for eight weeks or sold for \$3.50.

Atkins Silver Steel Practice Filing Strips, 8 x 2 $\frac{1}{2}$, teeth one edge, eight point rip teeth, the other edge 10 point crosscut teeth with a section one inch at the end of each pattern tooth filed and set correctly to be used as a sample for student to follow, \$1.80 per dozen net. These filing strips may be used by the beginner to save good saws. Too, the sample with correct set and filing is valuable.

BALCO ELECTRIC TOOL & SUPPLY CO., CHICAGO.

General Catalog No. 13, forty pages, five cents. Rating X. The tools contained herein are, generally speaking, of the light variety and are good for the home shop or the school where the work is light.

BOICE CRANE COMPANY, TOLEDO, OHIO.

General Catalog Q-2 1940, forty-four pages. Rating X. This catalog illustrates a complete line of woodworking machinery.

HOME MECHANICS (Continued)

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X.
The books listed are fully annotated.

BUCK BROTHERS, MILLBURY, MASS.

Catalog and Price List, Edge Tools and Carving Tools, fifty-two pages, heavy paper binding, free. Rating X.
This catalog lists a complete line of wood chisels, cold chisels, carving tools, draw knives, etc.

THE M. L. CAMPBELL COMPANY, KANSAS CITY, MO.

Furniture Finishing, twenty-nine pages, paper back, free.
Rating A.
This booklet will prove valuable in finishing and in re-finishing.

Instruction Book how to use Campbell Finish Repair Specialties, fifty-five pages, cardboard back, free. Rating A.
This book will prove very helpful in dealing with the repair of spots, scratches, rubs, and checks in paints, enamels, and varnishes of different kinds.

Campbell's Industrial Finishes Price List No. 109A, thirty-two pages, free. Rating X.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, NEW YORK.

Short Cuts to Better Work for the Home Craftsman, 100 pages, free. Rating A.
This book contains dozens of sound ideas to aid the workman. Sharpening of knives, plane blades, chisels, axes, wood-carving tools, augerbits, and many other things are explained. Workable ideas on many other things are explained to the workman's satisfaction.

Wheel Gradings for all Classes of Grinding, seventy-nine pages, light cardboard binding, free. Rating X and A.

HOME MECHANICS (Continued)

This booklet is designed for the purpose of teaching the buyer some of the important factors influencing the selection of grinding wheels. Grading tables and tables of grinding wheel speeds are published to aid the buyer.

"Aloxite-TP" Modern Polishing Practice, twenty-four pages, free. Rating X and B.

This is an electrically fused alumina made for use in the polishing shops. This manual points out the best practices for setting up modern abrasives. The appendix gives five pages of handy data for the polisher.

Mounted Wheels, twenty-four pages, attractively illustrated, free. Rating X and A.

This booklet is a catalog of facts and illustrations concerning high speed grinding machines. Useful in the machine shop, glass and pottery plants, and tire and rubber plants.

Tool Room Grinding, 132 pages, table of contents, free.

Rating A.

This book on tool room grinding is an attempt to bring to the grinding wheel user a better understanding of grinding wheels and their relation to the various operations of tool sharpening and miscellaneous grinding performed in the tool room. The drawings, photographs, and tables show the various machines, typical tool set-ups, and the results that should be obtained through each correct grinding.

Carborundum and Aloxite Brand Grinding Wheel Catalog, about 158 pages, book. Rating X.

This book describes a complete line of grinding wheels, insert teeth, disc wheels, dressers, and whet stones.

The Abrasives in the Service of Industry, by Frank J. Tone, President of the Carborundum Co., eighteen pages, free.

Rating B.

This pamphlet contains a description of the present abrasives used in industry. The narrative "Abrasives in the Service of Industry" is more or less a chronological description of the evolution of abrasives.

The Romance of Carborundum, nineteen pages, pamphlet, free.

Rating A.

This pamphlet is a printed story of the history of carborundum. The story is very well written and very interesting.

HOME MECHANICS (Continued)

Grinding Wheels, ten page folding pamphlet, free. Rating X. The title gives a full indication of the contents of this pamphlet.

Jointer and Sharpening Stones by Carborundum for the Woodworking Trade, eight page folding pamphlet, free. Rating X.

Coated Abrasive Products for all Purposes, sixty-eight pages, free. Rating B.

The contents of this booklet are very well explained by the title, but it also contains several pages of directions for splicing cloth and paper abrasive belts.

THE COLORADO FUEL AND IRON CORP., DENVER, COLORADO.

Colorado Copper Bearing Nails, printed tin, 13½ x 19½, no charge. Rating A.

This wall chart will be very helpful in all woodworking classes, general shop classes and farm shop classes. The tin background makes for long life. The nails are beautifully arranged in deep colors, making the chart very attractive. Every nail from the common brad to the flat diamond point spike is pictured.

CRAFTSMAN WOOD SERVICE COMPANY, CHICAGO.

Hunt's Catalog No. 13 for Woodworkers, 136 pages, heavy paper binding, free. Rating X and B.

This catalog is more than a catalog of advertisement. It contains forty-five pages of woodfinishing helps, jig saw projects, and other projects.

DELTA MANUFACTURING COMPANY, MILWAUKEE, WISCONSIN.

Delta Industrial Tools, general catalog, Q-2, forty-seven pages, free. Rating X.

The Delta catalog is well written and very helpful.

The Deltagram, twelve to eighteen pages, published monthly from October to March, ten cents each. Rating A.

HOME MECHANICS (Continued)

(continued)

This brochure contains an average of fifty well drawn and illustrated articles ranging from toys to furniture in a series of six editions.

HENRY DISSTON & SONS, INC., PHILADELPHIA.

Disston Saw, Tool and File Manual, forty-six pages, slick paper back, no charge. Rating X and A.

This brochure is more than a catalog. It contains very valuable information on the selection, care and use of the file, saw and other tools. The information is given at the very beginning of the separate discussions. This will prove valuable in every shop where saws, files and other tools are used.

Disston Pruning Guide, thirty-six pages, light paper backs, free. Rating X and A.

This booklet has thirty pages devoted entirely to pruning with the Disston pruning equipment. Shrubs, vines, fruit trees, evergreens, shade trees, and flowers and pruning them are discussed rather thoroughly. This booklet should be kept by all who are not thoroughly familiar with the art of pruning.

How to use Handsaws for Crosscutting, Handsaws for Ripping, printed, 19 x 25, no charge. Rating A.

This wall chart is very practical, a great time saver, and visual aid of significance. It should be framed for best service from the light paper.

File Chart, printed, 19 x 25, no charge. Rating A.

Twelve common files, their uses and care are listed and pictured on this wall chart, which requires a frame for maximum life.

FERRO ENAMEL CORPORATION, CLEVELAND, OHIO.

The Finish on your Product, twelve pages, attractive colored binding, free. Rating X and B.

This booklet contains valuable suggestions to those who are planning doing some finishing. Porcelain enamels are the object of advertisements in this pamphlet.

HOME MECHANICS (Continued)

GRAND RAPIDS WOOD FINISHING CO., GRAND RAPIDS, MICHIGAN.

Purchaser's Guide, woodfinishing materials, thirty-six pages, light cardboard binding. Rating X.

Better Wood Finishing, revised edition, twelve pages, light cardboard binding, no charge. Rating A.
This booklet will prove quite helpful in finishing projects. It contains nine chapters dealing with wood finishing from the stain to the finished product.

HARBOR PLYWOOD CORPORATION, HOQUIAM, WASHINGTON.

How to Build the Open Road 12-foot Plywood Utility Boat, sheet 28 x 11 folder, printed on both sides, no charge. Rating A.
This plan sheet gives full detail drawings for the construction of the 12-foot boat from water proof plywood.

Preparing and Repairing Plywood Surfaces, one page, printed, no charge, 9 x 12. Rating B.
This leaf needs no explanation as the name tells the contents.

How to Finish Harbord Plywood, four pages, printed, slick paper, no charge. Rating A.
This folder gives suggestions for paneling, painting, staining and wallpapering.

Paint-it Series, series of at least eighteen designs in separate four page booklets, numbered and named, rough paper backs, free. Rating A.
These booklets give definite suggestions on definite painting jobs.

Super-Harbord Plan Folders, single sheet 8½ x 11, folder, mimeographed, no charge. Rating A.
These folders are in a series of sixty-nine or more, numbered 68-A, 69-A, etc. The complete plans are given for tool boxes, boats, etc.

HOME MECHANICS (Continued)

JOHN HASSELL INC., BROOKLYN, NEW YORK.

Catalog, twenty-two pages, no charge. Rating X and B.
This catalog is a general catalog, but there are so many named illustrations of nails, rivets, escutcheon pins, drive screws, and special threaded nails, screws, and bolts that it is worth a great deal as an illustration of the use of the various products.

THE IRWIN AUGER BIT COMPANY, WILMINGTON, OHIO.

How to Select, Use and Care for Bits, thirty-two pages, paper cover, no cost. Rating B.
This booklet should be in every woodworking shop. It explains and illustrates in detail the kinds, uses, and care for bits, except the sharpening.

Irwin Auger Bits and Screw Drivers Catalog, No. 37, thirty-one pages, complete line, free. Rating X.

J. & H. METAL PRODUCTS CO., ROCHESTER, NEW YORK.

Power Homecraft Tools, twenty-four pages. Rating X.
This catalog advertises and illustrates a variety of light tools. They are more suitable for homecraft and light school work than for production.

KESTER SOLDER COMPANY, CHICAGO.

Facts on Soldering, thirty-three pages, manilla binding, no cost. Rating A.
This brochure will be of great value in the general shop or the metal and sheet metal shop. It is illustrated and is written in large-sized type.

LEPAGE'S ADHESIVES, GLOUCESTER, MASS.

Do's and Don'ts for Gluing, wall chart, 11 x 15½, free.
Rating A.

HOME MECHANICS (Continued)

LEPAGE'S ADHESIVES, (cont.)

This wall chart is excellent for the beginning woodworking student. The do's and don'ts are listed for LePage's glue, animal glue, and casein glue, besides many general directions for gluing wood.

LePage's glue, muscilage, pastes, adhesive specialities, signet inks, general catalog, free. Rating X.

THE MASONITE CORPORATION, CHICAGO.

Samples of Masonite Products, 6 x 8, free. Rating A and X.

Masonite 1940, twelve pages, descriptive, free. Rating X and B.

This bulletin is well written and gives the specifications that cover the greater number of Masonite installations. The uses of the products are described and pictured.

Detail Drawing Sheet, of many useful projects and directions for construction are sent free. Examples of these are sewing box, tool tray, dart baseball game, etc. Rating B.

MONITE WATERPROOF GLUE COMPANY, MINNEAPOLIS, MINN.

Craftsman's Manual, sixteen pages, heavy paper binding, price twenty-five cents, usually sent free on request. Rating A. This manual contains practical projects for the home craftsman and industrial arts shop. They are complete with working drawings with practical gluing theories.

NATIONAL LEAD COMPANY, ST. LOUIS.

Dutch Boy Painter Magazine, about 20 pages, published bi-monthly, in the interest of better painting, free to painters and paint dealers. Rating X and A. This magazine, besides the commercial value to the printer, contains many suggestions on painting and answers to painting problems. This is good for the school shop.

HOME MECHANICS (Continued)

NICHOLSON FILE COMPANY, PROVIDENCE, R. I.

A File for Every Purpose, twenty-five page booklet, heavy paper binding, free. Rating A.

This booklet is written for the purpose of aiding in the use and care of files. Fine illustrations of handling and using the file for many and varied purposes are given.

NORTH BROTHERS MANUFACTURING CO., PHILADELPHIA.

Yankee Tools, forty-five pages, general catalog. Rating X. This catalog advertises a full line of light home and shop hand equipment.

NORTON COMPANY, WORCESTER, MASS.

Cryatoldon and Diamond Wheels for Grinding Cemented Carbide Tools, forty-four pages, heavy paper binding, illustrated, free. Rating X and B.

This well illustrated booklet is very well described by its name.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

Horbide, thirteen pages, pamphlet, no charge. Rating X.

This pamphlet deals with the 'hardest material ever produced by man for commercial use.'

Abrasive Papers & Cloths for the Student and Home Craftsman, booklet, thirty-two pages, no charge. Rating X and B.

This booklet describes and illustrates how the Norton abrasive papers and cloths are made and used.

Norton Grinding Wheels for the Petroleum Industry, folder of twelve pages. Rating X.

HOME MECHANICS (Continued)

NORTON CO. (Cont.)

Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A.

This brochure is illustrated and contains much specific as well as general information on selection of grinding wheels.

How to Sharpen, forty-seven pages, booklet, heavy paper binding, no charge. Rating A.

This booklet is excellent for aiding in the selection of stones, sharpening chisels, knives, scissors, razors, lawn mowers, auger bits, etc., with illustrations of the strokes needed for the best results.

Abrasives Their History and Development, twenty-seven pages, heavy paper binding, free. Rating B.

This booklet is very well explained by the title.

Correct Wheels Required for Grinding the Cutting Carbides, eight pages, free. Rating B.

This pamphlet is one on grinding practices for best results from the grinding wheels.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, single sheet doubled, heavy paper, free. Rating X.

Grinding Wheels, general catalog, twenty-seven pages, free. Rating X.

Superfinishing with Norton Machines, Stones and Wheels, single folder of six pages, free. Rating X.

Grits and Grinds, about twelve pages, published twice a year, free. Rating X.

This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

OLIVER MACHINERY COMPANY, ST. LOUIS, MISSOURI.

HOME MECHANICS (Continued)

OLIVER CO. (Cont.)

Installation, Care and Operation of "Oliver" Circular Saw Benches, thirty-six pages, free. Rating A and X.

This is more than a general catalog. It has the last half of the publication devoted to the safety rules, operations and jigs for operation of the circular saws. It is well illustrated and very fine for the woodworking shop.

Proper Installation and Care of "Oliver" Band Saws, six pages, free. Rating A and X.

This instruction bulletin describes the installation, adjustments, lubrication, care, and safety of band saws.

THE H. H. PERKINS COMPANY, NEW HAVEN, CONN.

Instructions in Methods of Seat Weaving, 20 pages, free. Rating B.

This pamphlet gives very good instructions and illustrations on weaving seats. Several different types of weaves are included in these instructions.

POPULAR MECHANICS PRESS, CHICAGO.

Popular Woodturning, sixteen pages, twenty-five cents, (sent free occasionally), attractive cover. Rating A.

This booklet contains, illustrated step by step instructions in woodturning, giving the position of the tool and hand and kind of tool for various cuts. A few turned projects are listed near the end of the booklet.

.SARGENT AND COMPANY, NEW HAVEN, CONN.

Wood Bottom and Iron Planes, fifty-six pages, heavy paper binding, free. Rating X and X.

This booklet contains several pages of discussion on different kinds of planes and their uses.

Standard Steel Squares, thirty - one pages, free. Rating A.

This booklet is one of the best of the steelsquare explanations. The rafter tables on the Sargent squares are explained. Angle cuts for polygons are explained.

HOME MECHANICS (Continued)

SPEEDWAY MFG. COMPANY, CICERO, ILL.

Speedway Portable Electric Tools, thirty-four pages, free.

Rating X.

The catalog title designates the nature of the products handled.

STANLEY RULE AND LEVEL CO., NEW BRITAIN, CONN.

Stanley Rafter and Framing Squares, forty-seven pages, free.

Rating A.

This booklet contains valuable information on the general use of the steel square plus suggestions for cutting rafters of all kinds. Definitions of various carpentry terms are cited.

1940 Plan Packet (25 New Project Designs), fifty-cents.

Rating A.

This plan packet is well illustrated with complete drawings and directions for completing any project listed. These packets are kept up-to-date from year to year.

Notebook Pages of Work Instructions, single sheets, thirty-two pages, one-half cent each. Rating A.

The instruction sheets are very well written, and they are complete and full of information.

Tool Guide, thirty-two pages, twenty-five parts, fifteen cents for ten or more in order, indexed. Rating A.

The title indicates the contents of the publication. Almost every hand tool in common use is mentioned with ways of using it. This publication is very good.

General Catalog No. 34, 240 pages, free. Rating X and A.

This general catalog of the Stanley Rule and Level Plant is not only a catalog, but it contains about fifty pages of instruction sheets on the use of the tools listed. For example: Near where scrapers are listed, an operation sheet on the sharpening of scrapers is included.

Expert Soldering, twelve pages, pamphlet, free. Rating X and B.

This pamphlet is just as the name indicates. How to solder and what fluxes to use for best results are listed. Electric and non-electric soldering irons are included.

HOME MECHANICS (Continued)

STANLEY CO. (Cont.)

Notebook Pages of Metal Instruction, sheets, six pages, one-half cent each. Rating A.

These sheets are well written, complete in details, and very instructive.

Stanley Wall Cards, sixteen cards, thirty-two subjects, price \$1.50 per set. Rating A.

These cards will prove a great aid in saving time and giving the student correct techniques in woodworking.

J. D. WALLACE & COMPANY, CHICAGO.

The J. D. Wallace Woodworking Machines, Portable and Bench Type, Rating A.

This company manufactures a complete line of both light and production machines.

WESTERN PINE ASSOCIATION, PORTLAND, OREGON.

Plan Book for the Boy Builder, sixteen pages, illustrated, free. Rating A.

This plan booklet contains a dozen, fully illustrated specifications for building things useful. The drawings and explanations are complete. The finished product is pictured.

Wood Turning in the Home Workshop, twenty-three pages, illustrated, free. Rating B.

This booklet contains the general information needed in woodturning, recommendations for tools, and more than a half dozen projects with details for constructions.

Wood Carving for Pleasure, twenty-three pages, fine illustrations, free. Rating A.

This booklet contains recommendations for the tools needed in carving, types of wood carving, and drawn projects for wood carving.

Bunk Bedroom Details, single sheet, both sides, free. Rating B.

This specification sheet shows a very attractive bedroom bunk. The plans are a bit vague, but may be followed.

Modern Welsh Dresser Details, single sheet on both sides, free. Rating B.

The finished product is pictured. The details are simple. The project is very attractive.

HOME MECHANICS (Continued)

WOOD OF THE WORLD COMPANY, NEW YORK CITY.

Price List, twelve pages. Rating X.

This bulletin contains prices on rare and more common woods. The prices are usually reasonable.

MECHANICAL DRAWING

CHARLES BRUNING CO., INC., DRAFTING SUPPLIES, KANSAS CITY, MO.

General Catalog, thirteenth edition, 388 pages, with thirty-four pages of price lists attached, imitation leather binding, free. Rating X.

New Smoothness, Speed, Accuracy in Drafting with Touch Control Drafters, catalog, eight pages, free. Rating X.

New Light on Prints, catalog, sixteen pages. Rating X.

Sample Book of Tracing Papers, Cloths, and Drawing Papers, forty-five pages, paper binding, free. Rating X and A. This book is excellent for the drawing room. The samples may be used as test sheets.

Bruning Bellux, single page folded into eight pages, advertising, free. Rating X.

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X.

The books listed are fully annotated.

EUGENE DIETZGEN CO., CHICAGO.

Use and Care of Drawing Instruments, twenty-two pages, heavy paper binding, free. Rating A.

This booklet is a very nice treatise on the use and care of drawing instruments with very good illustrations.

Catalog No. 389, Drafting Materials, 115 pages, heavy paper binding, free. Rating X and B.

This catalog contains fifteen pages of tables, decimal equivalents, electrical symbols, plumbing symbols, architectural symbols, etc.

MECHANICAL DRAWING (Continued)

DIETZGEN. (Cont.)

✓ Catalog No. 94E, Drafting and Surveying Supplies, 128 pages, heavy paper binding, free. Rating X and B. This catalog with its conversion tables, map symbols, etc. is of interest to the surveyer.

✓ Sample Book of Tracing and Vellum Papers, sixteen sheets, heavy paper binding, free. Rating X and A. This sample book is an excellent book to have on hand when the selection of tracing and vellum papers are to be selected.

✓ Sample Book of Drawing and Tracing Papers, sixteen sheets, heavy paper binding, free. Rating X and A. This sample book is useful in the school or commercial drafting room in the selection of definite shades and grades of drawing and drafting papers.

✓ Decimal Equivalents of Parts of an Inch, printed chart, 24 $\frac{1}{2}$ x 33 $\frac{1}{2}$, no charge. Rating A. This wall chart will be of greatest use where decimal equivalents of parts of an inch are needed, as in the machine shop. It must be cared for carefully as it is on thin paper.

✓ CHARLES M. HIGGINS & CO. INC., BROOKLYN, N. Y.

✓ Higgins Color Card, single sheet 6 $\frac{1}{2}$ x 6 $\frac{1}{2}$ inches, no charge. Rating A. Color chart and color combinations. The colors are very vivid and definite.

✓ Drawing Ink Questionnaire, four sheets, mimeographed, no charge. Rating A. The title indicates the contents of this paper. The questions are ably answered by those in authority.

✓ Outline and Suggestions for Art Projects, series of sheets, mimeographed, 8 $\frac{1}{2}$ x 11, no cost. Rating A. (The Related Arts Service, N. Y.) This series of sheets is good in the art class or the industrial arts classes of mechanical drawing.

✓ Higgins Correlation Projects, eight pages, notebook size, no charge. Rating A. This pamphlet is in a series of nine or more. Each publication is an explanation of some project as bookbinding, portfolio making, paper decorating, etc.

MECHANICAL DRAWING (Continued)

✓
KEUFFEL & ESSER CO., ST. LOUIS, MO.

Graph Sheets Coordinate Papers and Cloths, catalog, heavy paper binding, sixty pages, free. Rating X.

Leroy Lettering Sets, sixteen pages, catalog, paper cover, no charge. Rating X.

Solar Ephemeris for 1940 and other Tables and Data useful to the Surveyor, brochure, ninety-seven pages, light cardboard binding, free. Rating X and B.

This brochure is fully described by the title.

✓
Drafting Materials their Care and Use, booklet twelve pages, free. Rating A.

This booklet is a great aid in the drawing room, especially to the beginning draftsman.

✓
Elementary Instructions for Operating the Slide Rule, sixteen pages, booklet, paper cover, free. Rating A.

No explanation needed. The title explains the contents fully.

THE LUFKIN RULE COMPANY, SAGINAW, MICHIGAN.

General Catalog No. 12, 257 pages, nicely bound book, free. Rating X.

This catalog is from the world's largest maker of such goods. Steel tapes, woven tapes, tape-rules, spring joint and boxwood rules, lumber rules, miscellaneous rules, and precision tools are manufactured by this company.

ABRASIVE PRODUCTS, INC., SOUTH BRAIRTREE, MASS.

Coated Abrasive Papers and Cloths, forty pages, heavy paper binding, general catalog, illustrated, free. Rating X and B.

This catalog contains tables and other specifications with prices of material of interest to the buyer. The discussions of the different kinds of abrasives in the front of the book is valuable for classroom use.

Advertising Spring 1940, eleven pages stapled together, free. Rating X.

In this advertising are shown correct ways of doing many things of interest to the woodworker.

MECHANICAL DRAWING (Continued)

ABRASIVES PRODUCTS (Cont.)

Sandpaper, eight pages, stapled together, mimeographed, free. Rating A.

This treatise on sandpaper is very thorough in its discussion of abrasive papers and cloths. Its origin, trade names, uses, and symbols used in grading are discussed rather fully. This is a very good aid to have wherever sandpaper is used.

LEATHER WORK

W. A. HALL & SON FANCY LEATHERS, BOSTON.

Samples, fifty-eight sewed to cards, buttons to match, free. Rating A.

These sample leathers represent lamb, cow, calf, and goat leather. Either lacing or tooling leathers may be bought from the Hall Stores. Prices are attached to the samples.

LAPCHESKE LEATHER COMPANY, DES MOINES, IOWA.

Leathercraft, thirty-six pages, full line leather, leathercraft supplies, and stamps, free. Rating X.

THE MANUAL ARTS PRESS, PEORIA, ILLINOIS.

Books, seventy-two pages. Rating X.

This bulletin lists books suitable for texts or supplementary material in industrial education, drawing and design, shop work, home workshop, art crafts, elementary school arts, and home economics.

OSBORN BROTHERS (LEATHERCRAFT), CHICAGO.

General Catalog, eighty pages, free. Rating X.

This catalog illustrates a general line of leather and leathercraft equipment.

J. E. RHODES AND SONS, PHILADELPHIA.

Directions for Lacing Belts, single folder, illustrated, free. Rating B.

This folder gives simple instructions for lacing the ordinary belts.

WILDER & COMPANY, CHICAGO.

"Wildercraft" the Leathercraft Hobby, twenty pages, attractive paper binding, full line leathercraft materials, free. Rating X.

LEATHER WORK (Continued)

WILDER & CO. (Cont.)

Wildcraft Instruction Pamphlets, four page detailed instructions, five cents each, less in quantities. Rating A.

This set of instruction pamphlets contains twenty-seven separate pamphlets, varying in difficulty of construction.

MACHINE SHOP

ABRASIVE ENGINEERING CORP., DETROIT.

Grade-O-Meter, a catalog folder, six pages, free. Rating X and B.

This catalog folder is helpful concerning the grades of grinding wheels.

The Grade-O-Meter and its Functions, 6 x 7 explanation sheet concerning the grading of grinding wheels by use of the Grade-O-Meter, free. Rating B.

Grade-O-Meters, single advertising sheet 8 x 11, free. Rating X.

The Grade-O-Meter Now at a Popular Price, catalog four pages, free. Rating X.

A Preventable Profit Leak, booklet, paper binding, ten pages, free. Rating B.

This booklet contains discussions of the grains and bonding substances of grinding wheels.

What Do You Know About Grinding Wheels? booklet, paper binding, eight pages, free. Rating B.

This little booklet contains information on the texture of grinding wheels, and what to look for when selecting grinding wheels.

ABRASIVE PRODUCTS, INC., SOUTH BRAIRTREE, MASS.

Coated Abrasive Papers and Cloths, forty pages, heavy binding, general catalog, illustrated, free. Rating X and B. This catalog contains tables and other specifications with prices of material of interest to the buyer. The discussions of the different kinds of abrasives in the front of the book is valuable for classroom use.

MACHINE SHOP (Continued)

ABRASIVES PRODUCTS (Cont.)

Advertising Spring 1940, eleven pages stapled together, free. Rating X.

In this advertising are shown correct ways of doing many things of interest to the woodworker.

Sandpaper, eight pages, stapled together, mimeographed, free. Rating A.

This treatise on sandpaper is very thorough in its discussion of abrasive papers and cloths. Its origin, trade names, uses, and symbols used in grading are discussed rather fully. This is a very good aid to have wherever sandpaper is used.

AMERICAN STEEL AND WIRE COMPANY, CHICAGO.

Making Steel and Wire, forty pages, illustrated, free. Rating A.

This booklet deals with the history of steel and wire, the mining of the ore, and the actual making of the products themselves. The booklet is well illustrated, with pictures, drawings and graphs of the processes gone through in the manufacture of these products.

ATLAS PRESS COMPANY, KALAMAZOO, MICHIGAN.

Manual of Lathe Operation and Machinists Tables, 234 pages, imitation leather binding, price \$1.00. Rating A.

This book will prove to be very valuable in the machine shop. It also has a chapter on woodturning. It is a machinist's textbook within itself. It contains excellent illustrations and a wealth of information of lathe care and construction, theory of metal cutting, cutting tools, the machining of various material, drilling and boring, thread cutting, lathe attachments and their uses, woodturning on the metal lathe, and machinists tables. The book is indexed, spiral bound, and contains blank pages for shop notes.

Threading Supplement to Adapt the Manual of Lathe Operation to the New Atlas, F-Series 10-inch Lathes, 64 pages, illustrated, paper cover, free. Rating A.

This pamphlet contains thirty-six pages of instructions on the Atlas F-Series 10-inch Lathe besides the twenty-five pages devoted to tables for thread cutting. The fine drawings and pictures along with the outstanding paragraph heads make this material very valuable to the machine shop worker or instructor.

MACHINE SHOP (Continued)

ATLAS PRESS CO. (Cont.)

Atlas Shop Equipment for 1940, General Catalog No. 40, seventy-two pages, price list of sixteen pages, included separately. Rating X.

Suggested Initial Equipment for Average School Workshop Requirements, 21 pages, paper binding. Rating A.

This booklet covers twenty pages of recommendations, one page advertisement, no illustrations, but does contain annotated lists of recommended tools.

Thread Forms and Formulas, printed blueprint, 17 x 21, no charge. Rating A.

This wall chart will be helpful in the machine shop. It should be framed or mounted so that it can be taken to the class for use in thread cutting.

Lathe Cutting Tools, printed blueprints, 17 x 21, no charge. Rating A.

This wall chart will be helpful in the machine shop. The cutting edge angle, side rake angle, etc. are given. It should be framed or mounted so that it can be taken to class for use in metal cutting, or metal lathe and bit design.

E. C. ATKINS AND COMPANY, INDIANAPOLIS, IND.

Atkins Grinding Wheels, Standard List Prices and general information, sixteen pages, free. Rating X.

BUFFALO FORGE COMPANY, MACHINE TOOL DIVISION, BUFFALO, N. Y.

General Catalog, 194 pages, free. Rating X.

Exercises for Forge Shop Practice, twenty pages, printed, manilla folder backs, loose leaf, free. Rating A.

This folder is very good for forge shop classes, as the name indicates. The exercises are numbered, illustrated and give stock needed, explanation, operation, and cautions.

BRUCE PUBLISHING CO., MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X.

The books listed are fully annotated.

HENRY DISSTON & SONS, INC., PHILADELPHIA.

Disston Saw, Tool and File Manual, forty-six pages, slick paper back, no charge. Rating X and A.

MACHINE SHOP (Continued)

DISSTON COMPANY (Cont.)

This brochure is more than a catalog. It contains very valuable information on the selection, care and use of the file, saw and other tools. The information is given at the very beginning of the separate discussions. This will prove valuable in every shop where saws, files and other tools are used.

Disston Hack Saw Chart, printed, 14 x 18 $\frac{1}{2}$, no charge. Rating A.

This wall chart will be helpful in the machine shop, or wherever the hack saw is used. The thin paper background requires a frame for class use.

File Chart, printed, 19 x 25, no charge. Rating A. Twelve common files, their uses and care are listed and pictured on this wall chart. This wall chart requires a frame for maximum life.

THE LARKIN AIR VISE COMPANY, PORTLAND, CONN.

Larkin Air Vise for Increased Production, standard specifications and price lists, single sheet, descriptive, free. Rating X.

NATIONAL TWIST DRILL & TOOL CO., DETROIT, MICHIGAN.

General Catalog, 312 pages, book, imitation leather binding, free. Rating X and A.

This book contains, other than the regular line of tools handled by the company, more than 100 pages of tables, rules, etc. that are very useful in the machine shop.

Metal Gauge for shaping drill points, reamers, hobs, milling cutters, and special tools, free. Rating A. This gauge will prove to be a very excellent aid in sharpening the tools named above.

NICHOLSON FILE COMPANY, PROVIDENCE, R. I.

File Philosophy, brochure, forty-eight pages, heavy paper binding, free. Rating A.

This brochure contains a short history of the file, some safety precautions in the use, handling, and care of the file, hints regarding the proper methods of using files and the various applications of the most common files.

MACHINE SHOP (Continued)

NICHOLSON FILE COMPANY (Cont.)

Nicholson Files and Rasps and X. F. Swiss Pattern Files, sixty-four pages, illustrated, indexed, paper binding, free. Rating X.

A File for every Purpose, twenty-five page booklet, heavy paper binding, free. Rating A.

This booklet is written for the purpose of aiding in the use and care of files. Fine illustrations of handling and using the file for many and varied purposes are given.

NORTON COMPANY, WORCESTER, MASS.

Crystaldon and Diamond Wheels for Grinding Cemented Carbide Tools, forty-four pages, heavy paper binding, illustrated, free. Rating X and B.

This well illustrated booklet is very well described by its name.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

Norbide, thirteen pages, pamphlet, no charge. Rating X. This pamphlet deals with the 'hardest material ever produced by man for commercial use'.

Abrasive Papers & Cloths for the Student and Home Craftsman, booklet, thirty-two pages, no charge. Rating X and B. This booklet describes and illustrates how the Norton abrasive papers and cloths are made and used.

Norton Grinding Wheels for the Petroleum Industry, folder of twelve pages. Rating X.

Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A. This brochure is illustrated and contains much specific as well as general information on selection of grinding wheels.

How to Sharpen, forty-seven pages, booklet, heavy paper binding, no charge. Rating A. This booklet is excellent for aiding in the selection of stones, sharpening chisels, knives, scissors, razors, lawn mowers, auger bits, etc., with illustrations of the strokes needed for the best results.

MACHINE SHOP (Continued)

NORTON COMPANY (Cont.)

Abrasives Their History and Development, twenty-seven pages, heavy paper binding, free. Rating X.
This booklet is very well explained by the title.

Correct Wheels Required for Grinding the Cutting Carbides, eight pages, free. Rating B.
This pamphlet is one on grinding practices for best results from the grinding wheels.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, single sheet doubled, heavy paper, free. Rating X.

Grinding Wheels, general catalog, twenty-seven pages, free. Rating X.

Superfinishing with Norton Machines, Stones and Wheels, single sheet folder of six pages, free. Rating X.

Grits and Grinds, about twelve pages, published twice a year, free. Rating X.
This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

REED-PRENTICE CORP., MACHINE TOOLS, WORCESTER, MASS.

No. 2V Router and Vertical Milling Machine, descriptive folder, six pages, punched for standard notebook, free. Rating X.

New No. 3VG Reed-Prentice Vertical Milling and Die Sinking Machine, six page descriptive folder, punched for standard three hole notebook, free. Rating X.

No. 5 Vertical Miller and Die Sinker, with vertical gear drive to spindle, illustrated, six page folder, punched for standard three hole notebook, free. Rating X.

SOUTH BEND LATHE WORKS, SOUTH BEND, INDIANA.

Modern School Shops, thirty-two pages, attractive light cardboard binding, free. Rating A.
This booklet is designed to show the very interesting school shops, both large and small, which use the South Bend lathes. Almost every page is covered with a photograph of some outstanding school shop.

MACHINE SHOP (Continued)

SOUTH BEND LATHE WORKS (Cont.)

The South Bend Machine Shop Course, Book No. 39-M, thirty-two pages, twelve projects, heavy rough paper binding, fifty cents (often sent free on request). Rating A. This machine shop course book is used for instruction in machine shop practice by leading vocational and industrial training schools. It was developed by the South Bend Lathe Works.

Planning the Industrial Apprentice Training Shop, seventeen pages, mimeographed, stapled together at top, free. Rating B.

This bulletin discusses the possible solution for arranging the machine shop and the possible solution to care for the apprentice to be trained for industry. An attached questionnaire is for the purpose of aiding the local shop man in arranging his shop to best advantage.

How to Run a Lathe, 128 pages, attractive binding in heavy paper, twenty-five cents, prepaid. Rating A.

This book is prepared to aid the beginner or apprentice in the machine shop and the student in the school shop to secure a better understanding of the fundamentals of the operation of a modern screw cutting engine lathe. "In illustrating and describing the fundamental operations of modern lathe practice, we have made an effort to show only the best and most practical methods of machine shop practice in use in modern industries in the United States." (From Preface of How to Run a Lathe).

South Bend Lathes, Catalog 100, 112 pages, indexed, illustrated, full line machine lathes, free. Rating X.

If I were 21, by William S. Knudson, President of General Motors Corporation as told by Beverly Smith, ten pages, paper binding, free. Rating A.

This booklet is written by a man who has worked out the problems that face a young man today. He has the real life answers. He charts what he believes are a few wrongs in the world of general business and industry today. He has a solution for it. It is good reading.

South Bend Lathe, wall chart, 18 x 22, blue print of the 11-inch swing 5½ foot bed lathe, free. Rating X and A. This book is prepared to aid the beginner or apprentice. All parts are lettered and named below, letters corresponding to parts designated.

How to Become a Machinist, 13 x 22, wall chart, printed blue print, free. Rating A.

This wall chart contains seventeen things that will help any one along the way of becoming a better machinist.

MACHINE SHOP (Continued)

SOUTH BEND LATHE WORKS (Cont.)

Decimal Equivalents, wall chart, 13 x 22, printed blue print, free. Rating A.

This wall chart, as suggested by the title, contains decimals equivalent to corresponding common fractions.

WALLACE SUPPLIES MFG. COMPANY, CHICAGO.

The Wallace Benders, catalog no. 32A, about 110 pages, free, loose leaf binding type. Rating X.

These bending machines are well illustrated with illustrations of work done.

PHOTOGRAPHY

EASTMAN KODAK COMPANY, ROCHESTER, NEW YORK.

Sound Kodascope, sixteen pages, free. Rating X.

Kodak, forty pages, free. Rating X.

Cine-Kodak, Home Movie Equipment, 8mm. and 16mm., thirty-two pages. Rating X.

An Elementary Course in Photography, forty-one pages, thirty lessons, bound loose leaf style in manilla folder, free. Rating A.

This instruction manual is all that the title names it. It is excellent for school or for home amateur photography.

Bulletin No. 45, School Camera Club Dark Room, Furnishings and Equipment, nine sheets, loose leaf style, no cover, free. Rating A.

This set of instruction sheets will prove very valuable in connection with the "Elementary Course in Photography" or in building, furnishing, and equipping a photographer's dark room. The pictures and drawings are good.

Kodak Exposure Table for Outdoor Use, single folder, 2 $\frac{1}{2}$ x 5, no charge. Rating A.

This folder of the exposure table is in readable form and should not prove hard to follow.

Kodak, General Catalog of the Eastman Kodak Company, thirty-seven pages, free. Rating X.

PHOTOGRAPHY (Continued)

EASTMAN KODAK COMPANY (Cont.)

Color With Your Camera, folder, no cost. Rating X.
This folder is illustrated with technicolor photographs.

At Home With Your Kodak, thirty-two pages, heavy paper binding, no charge. Rating B.

This booklet is one with actual photographs giving the timing and desirable poses, focuses, and best location for best results.

Picture Taking At Night, thirty-seven page booklet, heavy paper binding, no cost. Rating A.
The name of this booklet explains the contents. It should prove of interest and value to those who are not professional.

The Velox Book, no charge, twenty-nine pages. Rating X.

How To Develop, folder, ten pages, no cost. Rating B.
This folder gives steps and illustrations on the development of pictures. It should prove helpful to the beginner.

Kodak Film, folder, free. Rating X.

Kodak Picture-Making Aids, paper cover, forty pages, no cost. Rating X.

PRINTING

AMERICAN TYPE FOUNDERS, ELIZABETH, N. J.

Why Teach Printing? twenty-four pages, attractive paper covering, free. Rating B.

This booklet is printed for the purpose of pointing out some of the reasons for adding the printing course to the industrial arts curriculum. The thoughts that many leading educators and business men have left us on the subject are published in this booklet.

A Selected List of Practical Books for Printers and Publishers, sixty pages, fully annotated, free. Rating A.
This booklet contains lists of books, fully annotated, on every part of the field of printing.

Handy Index of American Types, sixteen pages, face type examples, free. Rating A.

PRINTING (Continued)

AMERICAN TYPE FOUNDERS (Cont.)

This hand book is printed to give the actual showing of the type, with a title line above each face to identify it as to its serial number, the size in which the showing is set and the other sizes in which the face is available.

Lecture, delivered by Arthur B. Ormsbee, President Commonwealth Printing Company, Grand Rapids, Michigan, at a Printing Section Meeting American Vocational Association Convention, Grand Rapids, Michigan, December 6-10, 1939, eight pages, stapled in corner, mimeographed, free. Rating A.

This paper was delivered to a body of the leading vocational printers. Mr. Ormsbee's opinion of the part that the printing press has played in the political, social, economic, mechanical, and religious development is set forth in a very convincing and interesting manner.

Advertising Sheets and Folders, single page up to several pages, attractively illustrated, oil paper, complete line of types, desks, stapling machines, binding machines, cabinets, and presses, free. Rating X.

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X.

The books listed are fully annotated.

THE MANUAL ARTS PRESS, PEORIA, ILLINOIS.

Books, seventy-two pages. Rating X.

This bulletin lists books suitable for texts or supplementary material in industrial education, drawing and design, shop work, home workshop, art crafts, elementary school arts, and home economics.

WESTERN STATES ENVELOPE COMPANY, MILWAUKEE, WISCONSIN.

Price List, sixty-seven pages, loose leaf binding, free. Rating X.

This is a very complete listing of paper supplies for the printer of office or civilian.

SHEET METAL WORK

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X.

The books listed are fully annotated.

CROWN SPRAY GUN MFG. COMPANY, LOS ANGELES, CALIFORNIA.

New Airflo Portable Painting Outfits, single folder of eight pages, free. Rating X.

Crown Spray Guns, single folder of six pages. Rating X. These advertisement folders describe these spray paintings very effectively. They are printed in colors.

THE DEVILBISS COMPANY, TOLEDO, OHIO.

A B C of Spray Painting Equipment, thirty-two pages, heavy paper cover, price twenty-five cents, (usually sent free on request). Rating A.

This booklet contains practically all of the common questions and answers pertaining to the operation, use, care, and adjustments of Spray Painting Equipment. It is in answer to many requests for a simple booklet which would provide the ground work for a general understanding of all the basic principles involved. The questions selected were chosen from hundreds which have been repeated time and time again at the DeVilbiss Training School and at numerous clinics.

GARDINER METAL COMPANY, CHICAGO.

How to Solder Perfectly, twelve pages, heavy paper binding, no charge. Rating A.

This booklet is devoted, as the name indicates, to how to solder. The proper steps in soldering and many suggestions should be of great value to the worker.

JOHN HASSELL, INC., BROOKLYN, NEW YORK.

Catalog, twenty-two pages, no charge. Rating X and B. This catalog is a general catalog, but there are so many named illustrations of nails, rivets, escutcheon pins, drive screws, and special threaded nails, screws, and bolts that it is worth a great deal as an illustration for use of the various pictures.

SHEET METAL WORK (Continued)

KESTER SOLDER COMPANY, CHICAGO.

Facts On Soldering, brochure, thirty-three pages, manilla binding, no cost. Rating A.

This brochure will be of great value in the general shop or the metal and sheet metal shop. It is illustrated and is written in large-sized type. Samples.

THE MANUAL ARTS PRESS, PEORIA, ILLINOIS.

Books, seventy-two pages. Rating X.

This bulletin lists books suitable for texts or supplementary material in industrial education, drawing and design, shop work, home workshop, art crafts, elementary school arts, and home economics.

NIAGARA MACHINE AND TOOL WORKS, BUFFALO, N. Y.

✓ School Equipment and Floor Plans for Sheet Metal Classes, single sheet of six pages, free. Rating X.

Although this sheet is rated X, it contains some nice floor plans for the sheet metal class arrangement of tools, and suggestions for equipment.

Handy Reference Booklet for Sheet Metal Work, twenty-four pages, free. Rating X and B.

This booklet is made up largely of advertising, but contains several pages of tables very useful to the sheet metal worker.

✓ Helps for Sheet Metal Men, chart 17 x 21½, metal edges at top and bottom, eye for hanging. Rating A.

This chart gives actual pictures of sheet metal tool processes and time saving reference tables of circumferences and areas of circles, formulas for estimating the weight of metal for rectangular and round duct work, and standard U. S. gauge of sheet iron.

NICHOLSON FILE COMPANY, PROVIDENCE, R. I.

File Philosophy, brochure, forty-eight pages, heavy paper binding, free. Rating A.

This brochure contains a short history of the file, some safety precautions in the use, handling, and care of the file, hints regarding the proper methods of using files and the various applications of the most common files. It contains several illustrations.

SHEET METAL WORK (Continued)

NICHOLSON FILE COMPANY (Cont.)

Nicholson Files and Rasps and X. F. Swiss Pattern Files, sixty-four pages, illustrated, indexed, paper binding, free. Rating X.

✓ A File for every Purpose, twenty-five page booklet, heavy paper binding, free. Rating A.

This booklet is written for the purpose of aiding in the use and care of files. Fine illustrations of handling and using the file for many and varied purposes are given.

NORTON COMPANY, WORCESTER, MASS.

Crystaldon and Diamond Wheels for Grinding Cemented Carbide Tools, forty-four pages, heavy paper binding, illustrated, free. Rating X and B.

This well illustrated booklet is very well described by its name.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

Norbide, thirteen pages, pamphlet, no charge. Rating X. This pamphlet deals with the 'hardest material ever produced by man for commercial use'.

Abrasive Papers & Cloths for the Student and Home Craftsman, booklet, thirty-two pages, no charge. Rating X and B. This booklet describes and illustrates how the Norton abrasive papers and cloths are made and used.

Norton Grinding Wheels for the Petroleum Industry, folder of twelve pages. Rating X.

Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A.

This brochure is illustrated and contains much specific as well as general information on selection of grinding wheels.

✓ How to Sharpen, forty-seven pages, booklet, heavy paper binding, no charge. Rating A.

This booklet is excellent for aiding in the selection of stones, sharpening chisels, knives, scissors, etc., with illustrations of the strokes needed for the best results.

SHEET METAL WORK (Continued)

NORTON COMPANY, (Cont.)

Abrasives Their History and Development, twenty-seven pages, heavy paper binding, free. Rating X and B.
This booklet is very well explained by the title.

Correct Wheels Required for Grinding the Cutting Carbides, eight pages, free. Rating B.
This pamphlet is one on grinding practices for best results from the grinding wheels.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, single sheet doubled, heavy paper, free. Rating X.

Grinding Wheels, general catalog, twenty-seven pages, free. Rating X.

Superfinishing with Norton Machines, Stones and Wheels, single sheet folder of six pages, free. Rating X.

Grits and Grinds, about twelve pages, published twice a year, free. Rating X.
This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

PEXTO; THE PECK, STOW AND WILSON CO., SOUTHINGTON, CONN.

✓ Bulletin No. 5B-35, eight pages, free. Rating X and B.
This bulletin includes three pages of drawings and explanations of sheet metal workings. The remaining pages are advertising.

✓ Catalog No. 35A, 112 pages, heavy paper binding, indexed, complete line of metal-working tools and machines, free. Rating X.

Individual Machine Instruction Sheets, twelve sheets, 8½ x 11, heavy oil paper, suitable for posting. Rating X and B.
These instruction sheets illustrate the workings of the various Pexto Machines for the tin shop.

WHITE METAL (PEWTER) ROLLING & STAMPING CORP., BROOKLYN, N. Y.

History of Pewter, ten pages, mimeographed, free. Rating A.
These mimeographed leaves stapled together contain more than the history of pewter. They contain four pages of projects to be made from pewter, and instructions for constructions.

WOODWORK

ABRASIVE ENGINEERING CORPORATION, DETROIT, MICHIGAN.

Grade-O-Meter, a catalog folder, six pages, free. Rating X and B.

This catalog folder is helpful concerning the grades of grinding wheels.

The Grade-O-Meter and its Functions, 6 x 7 explanation sheet concerning the grading of grinding wheels by use of the Grade-O-Meter, free. Rating B.

Grade-O-Meters, single advertising sheet, 8 x 11, free. Rating X.

The Grade-O-Meter Now at a Popular Price, catalog four pages, free. Rating X.

A Preventable Profit Leak, booklet, paper binding ten pages, free. Rating B.

This booklet contains discussions of the grains and bonding substances of grinding wheels.

What Do You Know About Grinding Wheels? booklet, paper binding, eight pages, free. Rating B.

This little booklet contains information on the texture of grinding wheels and what to look for when selecting grinding wheels.

✓
ABRASIVE PRODUCTS, INC., SOUTH BRAintree, MASS.

Coated Abrasive Papers and Cloths, forty pages, heavy paper binding, general catalog, illustrated, free. Rating X and B.

This catalog contains tables and other specifications with prices of material of interest to the buyer. The discussions of the different kinds of abrasives in the front of the book is valuable for classroom use.

Advertising Spring 1940, eleven pages stapled together, free. Rating X.

In this advertising are shown correct ways of doing many things of interest to the woodworker.

✓
Sandpaper, eight pages, stapled together, mimeographed, free. Rating A.

This treatise on sandpaper is very thorough in its discussion of abrasive papers and cloths. Its origin, trade names, uses, and symbols used in grading are discussed rather fully. This is a very good aid to have wherever sandpaper is used.

WOODWORK (Continued)

ADJUSTABLE CLAMP COMPANY, CHICAGO.

Catalog No. 14, thirty-two pages, free. Rating X.

Loose Leaves, Form L14, four pages, free. Rating X.
Both these are advertisements with illustrations of kinds of clamps.

AMERICAN SCREW COMPANY, PROVIDENCE, RHODE ISLAND.

American Screw Chart, printed, backed with cheesecloth, metal across ends, eye for hanging, 15½ x 32, no charge. Rating A.

This wall chart will be helpful in the woodworking shop. Styles and sizes of screws are illustrated. Bit sizes for boring pilot holes and shank clearance holes are also illustrated in tables.

Plus Sign Head, single sheet folded into sixteen pages. Rating X.

These folders advertise the Phillips Screw with the cross in the top replacing the single groove.

E. C. ATKINS AND COMPANY, INDIANAPOLIS, INDIANA.

Saw Sense, forty-eight pages, paper binding, free. Rating A.

This booklet contains ten pages of directions for caring for saws, four pages of valuable information to the everyday carpenter, ten pages of job sheets, and three pages of carpenter's table of wages. It will be very valuable in the woodworking shop.

Atkins Grinding Wheels, Standard List Prices and General Information, eighteen pages, free. Rating X.

Atkins Machine Knives, Grinding Hints, General Information, sixteen pages, free. Rating X and B.

This bulletin gives several pages of hints on grinding and shaping knives and blades. Very helpful.

Atkins Mill Saws, forty-eight pages, general catalog of saws, saw tools, grinders, and machine knives, free. Rating X.

The Demonstration Saw, it clearly shows the different types of teeth used in handsaws and the two types of handles commonly used. Loaned for eight weeks or sold for \$3.50.

WOODWORK (Continued)

E. C. ATKINS COMPANY (Cont.)

Atkins Silver Steel Practice Filing Strips, 8 x 2½, teeth one edge, eight point rip teeth, the other edge ten point crosscut teeth with a section one inch at the end of each pattern tooth filed and set correctly to be used as a sample for students to follow, \$1.80 per dozen net. These filing strips may be used by the beginner to save good saws. Too, the sample with correct set and filing is valuable.

BALKO ELECTRIC TOOL & SUPPLY COMPANY, CHICAGO.

General Catalog, No. 13, forty pages, five cents. Rating X.

The tools contained herein are, generally speaking, of the light variety and are good for the home shop or the school shop where the work is light.

BLACK & DECKER PORTABLE ELECTRIC TOOLS, TOWSON, MARYLAND.

Portable Electric Saw Handbook, twenty-four pages, illustrated, paper binding, free. Rating X and B. This handbook deals with different uses that the portable saw is put to. They are in no sequence, but will be of value to any one who uses a portable electric saw.

Portable Electric Tools, sixty-one pages, full line, free. Rating X.

BOICE CRANE COMPANY, TOLEDO, OHIO.

General Catalog "Q-2", 1940, forty-four pages. Rating X. This catalog illustrates a complete line of woodworking machinery.

BUCK BROTHERS, MILLBURY, MASS.

Catalog and Price List, Edge Tools and Carving Tools, fifty-two pages, heavy paper binding, free. Rating X. This heavy catalog lists a complete line of wood chisels, cold chisels, carving tools, draw knives, etc.

BRUCE PUBLISHING COMPANY, MILWAUKEE, WISCONSIN.

Bruce School Books, general catalog, seventy pages. Rating X. The books listed are fully annotated.

WOODWORK (Continued)

✓ THE M. L. CAMPBELL COMPANY, KANSAS CITY, MO.

✓ Furniture Finishing, twenty-nine pages, paper back, free. Rating A.

This booklet will prove valuable in finishing and in re-finishing.

✓ Industrial Lacquers, Synthetics, color card. Rating B. This folder color card is useful in matching the stick shellac to the woods, or for finishing.

✓ Stick Shellac, samples on cards $2\frac{1}{2} \times 7$, no charge. Rating A.

This card display will be very helpful in matching the shellac to the wood to be used upon.

✓ New Angles in Furniture Finishing, sixteen pages, paper backs, free. Rating A. The contents of this booklet are fully explained in the title.

✓ Instruction Book How to Use Campbell Finish Repair Specialties, fifty-five pages, cardboard back, free. Rating A.

This book will prove very helpful in dealing with the repair of spots, scratches, rubs, and checks in paints, enamels, and varnishes of different kinds.

✓ Campbell's Industrial Finishes Price List, No. 109A, thirty-two pages, free. Rating X.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

✓ Wheel Gradings for all Classes of Grinding, seventy-nine pages, light cardboard binding, free. Rating X and A. This booklet is designed for the purpose of teaching the buyer some of the important factors influencing the selection of grinding wheels. Grading tables and tables of grinding wheel speeds are published to aid the buyer.

✓ "Aloxite-TP" Modern Polishing Practice, twenty-four pages, free. Rating X and B.

This is an electrically fused alumina made for use in the polishing shops. This manual points out the best practices for setting up modern abrasives. The appendix gives five pages of handy data for the polisher.

✓ Mounted Wheels, twenty-four pages, attractively illustrated, free. Rating X and A.

WOODWORK (Continued)

CARBORUNDUM COMPANY (Cont.)

This booklet is a catalog of facts and illustrations concerning high speed grinding machines. Useful in the machine shop, glass and pottery plants, and tire and rubber plants.

Tool Room Grinding, 132 pages, table of contents, free. Rating A.

This book on tool room grinding is an attempt to bring to the grinding wheel user a better understanding of grinding wheels and their relation to the various operations of tool sharpening and miscellaneous grinding performed in the tool room. The drawings, photographs, and tables show the various machines, typical tool set-ups, and the results that should be obtained through each correct grinding.

Carborundum and Aloxite Brand Grinding Wheel Catalog, about 158 pages, book. Rating X.

This book describes a complete line of grinding wheels, insert teeth, disc wheels, dressers, and whet stones.

The Abrasives in the Service of Industry, by Frank J. Tone, President of the Carborundum Company, eighteen pages, Free. Rating B.

This pamphlet contains a description of the present abrasives used in industry. The narrative "Abrasives in the Service of Industry" is more or less a chronological description of the evolution of abrasives.

The Romance of Carborundum, nineteen pages, pamphlet, free. Rating A.

This pamphlet is a printed story of the history of carborundum. The story is very well written and very interesting.

Grinding Wheels, ten page folding pamphlet, free. Rating X. The title gives a full indication of the contents of this pamphlet.

Jointer and Sharpening Stones by Carborundum for the Woodworking Trade, eight page folding pamphlet, free. Rating X.

Coated Abrasive Products for all Purposes, sixty-eight pages, free. Rating B.

The contents of this booklet are very well explained by the title, but it also contains several pages of directions for splicing cloth and paper abrasive belts.

WOODWORK (Continued)

✓
CASEIN COMPANY OF AMERICA, NEW YORK.

✓
Casco Gluing Guide, thirty-six pages, paper binding, free. Rating A.

This brochure will be very helpful in the woodworking shop and in the general shop. It is especially useful to the beginner and the home workman. Twenty-seven pages are devoted to instructions on the use of glue, and how it is applied.

✓
CHICAGO WHEEL & MANUFACTURING COMPANY, CHICAGO.

Chicago Grinding Wheels, fifty-four pages, indexed, illustrated, free. Rating X and B.

This booklet is designed to reach individual needs. The great variation in the shapes of the wheels makes it possible to fill an almost unlimited assortment of specifications.

✓
Handee Hobbies Work Sheets, complete drawings and instructions, free. Rating A.

These work sheets vary in size from 8½ x 11 to 17 x 22. The plans are complete and ready to be used in construction. They are designed chiefly for employing the Handee electrical hand corner. Wood is employed in their construction. There are about 400 sheets of plans.

CINCINNATI TOOL COMPANY, NORWOOD, CINCINNATI, OHIO.

Catalog No. 106, clamps, chisels, punches, drills, and anvils, twenty-one pages, free. Rating X and C.

This booklet contains only a few items of educational interest. Two of these are the tests given clamps, page seven, and the tests given chisels, page nineteen.

Hargrave Folder, chisels, punches, and drills, four pages, free. Rating X and B.

This folder contains enlarged drawings of the shapes of the points of different chisels, and a photograph of how to use a star hand drill. This will be valuable wherever tool work is done.

✓
THE COLORADO FUEL AND IRON CORPORATION, DENVER, COLORADO.

✓
Colorado Copper Bearing Nails, printed tin, 13¼ x 19¼, no charge. Rating A.

This wall chart will be very helpful in all woodworking classes, general shop classes and farm shop classes. The tin background makes for long life. The nails are beautifully arranged in deep colors, making the chart attractive.

WOODWORK (Continued)

THE COLUMBIAN VISE AND MFG. COMPANY, CLEVELAND, OHIO.

Catalog No. 40, twelve pages, paper binding. Rating X.
A complete line of the various vises. Illustrated with prices.

CONTINENTAL MACHINES INCORPORATED, MINNEAPOLIS, MINN.

DoAll Precision File Bands, four page folder, free.
Rating X.

This folder illustrates a very novel and different machine file band. It is used as a band saw blade, but the files are in broken lengths and fastened in a short place on the band, for circular motion, then joined together again when the blade is straight.

Band Sawing, Filing, Polishing Machine, four page folder, attractive illustrations, free. Rating X.

CRAFTSMAN WOOD SERVICE COMPANY, CHICAGO.

Hunt's Catalog No. 13, for Woodworkers, 136 pages, heavy paper binding, free. Rating X and B plus.
This catalog is more than a catalog of advertisement. It contains forty-five pages of woodfinishing helps, jig saw projects, and other projects.

CRESCENT MACHINE COMPANY, LEETONIA, OHIO.

Band Saws, twelve page pamphlet. Rating X.

Band Tables, twenty pages, pamphlet. Rating X.

Universal Woodworker, twenty-four pages, pamphlet.
Rating X.

Woodworking Machinery, Junior Line Catalog, Manual No. 239, thirty-four pages. Rating X.

Folders and Loose Leaves, seventy-five pages. Rating X.
These advertisements bulletins and other publications are very well explained with illustrations and drawings.

CROWN SPRAY GUN MFG. COMPANY, LOS ANGELES, CALIFORNIA.

New Airflo Portable Painting Outfits, single folder of eight pages, free. Rating X.

WOODWORK (Continued)

CROWN MFG. COMPANY (Cont.)

Crown Spray Guns, single folder of six pages. Rating X. These advertising folders describe the spray painting very effectively. They are printed in colors.

✓
DELTA MANUFACTURING COMPANY, MILWAUKEE, WISCONSIN.

Delta Industrial Tools, general catalog, Q-2, forty-seven pages, free. Rating X.

✓
How to Plan a School Workshop, forty pages, heavy paper back, price \$1.00. Rating A. (May be had from thirty to fifty cents in different quantities).

This is an excellent book for the person who is planning a shop or who is not familiar with the best arrangements for machines in a shop.

✓
The Deltagram, twelve to eighteen pages, published monthly from October to March, ten cents each. Rating A.

This magazine contains an average of fifty well drawn and illustrated articles ranging from toys to furniture in a series of six editions.

✓
THE DEVILBISS COMPANY, TOLEDO, OHIO.

✓
A B C of Spray Painting Equipment, thirty-two pages, heavy paper cover, price twenty-five cents, (usually sent free on request). Rating A.

This booklet contains practically all of the common questions and answers pertaining to the operation, use, care, and adjustment of Spray Painting Equipment. It is in answer to many requests for a simple booklet which would provide the ground work for a general understanding of all the basic principles involved. The questions selected were chosen from hundreds which have been repeated time and again at the DeVilbiss Training School and at numerous clinics.....(From the foreword of the booklet itself).

✓
HENRY DISSTON & SONS, INC., PHILADELPHIA.

✓
Disston Saw, Tool and File Manual, forty-six pages, slick paper back, no charge. Rating X and A.

This brochure is more than a catalog. It contains very valuable information on the selection, care and use of the file, saw and other tools. This will prove valuable in every shop where saws, files and other tools are used.

WOODWORK (Continued)

HENRY DISSTON (Cont.)

Disston Hack Saw Chart, printed, 14 x 18½, no charge.

Rating A.

This wall chart will be helpful in the machine shop, or wherever the hack saw is used. The thin paper background requires a frame for class use.

How to use Handsaws for Crosscutting, Handsaws for Ripping, printed, 19 x 25, no charge. Rating A.

This wall chart is very practical, a great time saver, and visual aid of significance. It should be framed for best service from the light paper.

File Chart, printed, 19 x 25, no charge. Rating A.

Twelve common files, their uses and care are listed and pictured on this wall chart. This wall chart requires a frame for maximum life.

J. A. FAY & EAGEN COMPANY, CINCINNATI, OHIO.

Woodworking Machinery, Direct Motor Driven Ball Bearing, eighteen pages, descriptive folder, full-line machines, free. Rating X.

This folder illustrates one of the oldest lines of tools in America.

FERRO ENAMEL CORPORATION, CLEVELAND, OHIO.

The Finish On Your Product, twelve pages, attractive light colored binding, free. Rating X and B.

This booklet contains valuable suggestions to those who are interested in finishing. Porcelain enamels are the object of interest in this pamphlet.

ALFRED FIELD & COMPANY, NEW YORK.

Wood Working Tools, twelve pages, free. Rating X.

This catalog illustrates tools as follows: wood turning, linoleum block cutting, wood carving and chip carving. It is for carpenters, cabinet makers, pattern-makers, woodturners, manual training schools, and home workshops.

WOODWORK (Continued)

GRAND RAPIDS WOOD FINISHING COMPANY, GRAND RAPIDS, MICH.

Purchaser's Guide, Catalog, woodfinishing materials, thirty-six pages, light cardboard binding. Rating X.

Better Wood Finishing, revised edition, twelve pages, light cardboard binding, no charge. Rating A.
This booklet will prove quite helpful in finishing projects. It contains nine chapters dealing with wood finishing from the stain to the finished product.

Sample Wood Panels, no charge. Rating A.
These wood finishing panels are excellent examples. On the back are directions for finishing.

HARBOR PLYWOOD CORPORATION, HOQUIAM, WASHINGTON.

How to Build the Open Road 12-foot Plywood Utility Boat, sheet 28 x 11, folded, printed on both sides, no charge. Rating A.

This plan sheet gives full detail drawings for the construction of the 12-foot boat from water proof plywood.

Preparing and Repairing Plywood Surfaces, one page, printed, no charge, 9 x 12. Rating B.
This leaf needs no explanation as the name tells the contents.

How to Finish Harbord Plywood, four pages, printed, sleek paper, no charge. Rating A.
This folder gives suggestions for paneling, painting, staining and wallpapering.

Paint-it Series, series of at least eighteen designs in separate four page booklets, numbered and named, rough backs, free. Rating A.
These booklets give definite suggestions on definite painting jobs.

Super-Harbord Plan Folders, single sheet 8½ x 11, folded, mimeographed, no charge. Rating A.
These folders are in a series of sixty-nine or more, numbered 68-A, 69-A, etc. The complete plans are given for tool boxes, shutters, boats, etc.

Super-Harbord, 8½ x 11 plan sheets, single sheets, mimeographed, no charge. Rating B.
These plan sheets are in a series of eighty-two or more, numbered 81-A, 82-A, etc. These plans run to residences, store fronts, etc. Some of the plans are a bit incomplete.

WOODWORK (Continued)

HARBOR PLYWOOD CORP. (Cont.)

Tomorrow's Construction Available Today with Super-Harbor, twenty pages, paper binding, no charge. Rating X and B.

This magazine, devoted exclusively to plywood, gives the uses to which it may be put.

Construction With Plywood, by Oscar Fisher, ten pages, sleek paper construction throughout, no charge. Rating A.

This article printed in magazine form with illustrations, gives a short history as well as the advantages of plywood in construction.

Money Saving Use Details, sixteen pages, heavy paper binding, no charge. Rating A.

This booklet gives a detailed set of sketches on plywood construction. Most of the booklet is given to construction plans for waterproof plywood usage.

Information on Super-Harbor, twelve pages, stiff paper cover, no charge. Rating A.

Information on the uses and making of plywood is contained in this booklet. There is a short discussion on Plycrete (concrete form panels).

Samples, one five-ply, 3/8 x 4/6 inches, weatherproof veneer, two three-ply 1/2 x 4 x 6 inches weatherproof veneer.

HUTHER BROTHERS SAW MANUFACTURING CO., ROCHESTER, N. Y.

Directions for Filing and Fitting Groovers and Circular Saws, twelve pages, no charge. Rating X and B plus.

This pamphlet contains six pages of instruction on the filing and fitting of groovers and circular saws. The steps in filing are given in chronological order.

THE IRWIN AUGER BIT COMPANY, WILMINGTON, OHIO.

How to Select, Use and Care for Bits, booklet, thirty-two pages, paper cover, no cost. Rating B.

This booklet should be in every woodworking shop. It explains and illustrates in detail the kinds, uses, and care for bits, except the sharpening.

Irwin Auger Bits and Screw Drivers, catalog, No. 37, thirty-one pages, complete line, free. Rating X.

WOODWORK (Continued)

J. & H. METAL PRODUCTS COMPANY, ROCHESTER, NEW YORK.

Power Homecraft Tools, general Catalog, twenty-four pages. Rating X.

This catalog advertises and illustrates a variety of light tools. They are more suitable for homecraft and light school work than for production.

✓
KEYSTONE GLUE COMPANY, WILLIAMSPORT, PENN.

✓
Doing the Gluing, gluing instruction chart, 16½ x 22, single sheet, no charge. Rating A.

This wall chart gives the step by step instructions for gluing with hide glue. The instructions are definite and good. For shop use the chart should be framed.

✓
Sample, one pound can of pure hide glue, shipped post-paid.

✓
Glue Handbook, sixty-three pages, attractive heavy paper binding, indexed, table of contents, free. Rating A. This handbook is all that the title suggests. It is for craftsmen, concerning the history, manufacture, and correct use of pure hide glue. It is very valuable for supplementary instruction in shop classes. The material is brief, some in outline form.

✓
THE LARKIN AIR VISE COMPANY, PORTLAND, CONN.

Larkin Air Vise for Increased Production, standard specifications and price lists, single sheet, descriptive, free. Rating X.

LEPAGE'S ADHESIVES, GLOUCESTER, MASS.

✓
Do's and Don'ts for Gluing, wall chart, 11 x 15½, free. Rating A.

This wall chart is excellent for the beginning woodworking student. The do's and don'ts are listed for LePage's glue, animal glue, and casein glue, besides many general directions for gluing wood.

LePage's glue, muscilage, pastes, adhesive specialties, signet inks, general catalog, free. Rating X.

WOODWORK (Continued)

THE LUFKIN RULE COMPANY, SAGINAW, MICHIGAN.

General Catalog No. 12, 257 pages, nicely bound book, free. Rating X.

This catalog is from the world's largest maker of such goods. Steel tapes, woven tapes, tape-rules, spring joint and boxwood rules, lumber rules, miscellaneous rules, and precision tools are manufactured by this company.

THE MASONITE CORPORATION, CHICAGO.

Masonite 1940, twelve pages, descriptive, free. Rating X and B.

This bulletin is well written and gives the specifications that cover the greater number of Masonite installations. The uses of the products are described and pictured.

Detail Drawing Sheets of many useful projects and directions for construction are sent free. Examples of these are sewing box, tool tray, dart baseball games, etc. Rating B.

Samples of Masonite products and a display case showing the processes used in the manufacture of Masonite products will be sent free on request.

MEGOW, LARGEST HOBBYCRAFT MANUFACTURER IN THE WORLD, CHICAGO.

Catalog No. 9, toy airplane issue, illustrated, free. Rating X.

MILLERS FALLS COMPANY, GREENFIELD, MASSACHUSETTS.

Tools, Catalog No. 42, 240 pages, plus eight pages memoranda, free. Rating X.

Miller Falls Electric Tools, twenty-four pages. Rating X. These catalogs list a very complete line of workshop hand tools and electric tools. It is indexed and contains a chapter on tool repair.

MONITE WATERPROOF GLUE COMPANY, MINNEAPOLIS, MINN.

Craftsman's Manual, sixteen pages, heavy paper binding, price twenty-five cents, (usually sent free on request). Rating A.

This manual contains practical projects for the home

WOODWORK (Continued)

MONITE COMPANY (Cont.)

craftsman and industrial arts shop, complete with working drawings with practical gluing theories.

Sample, five oz. package Monite casein glue, free.

NATIONAL LEAD COMPANY, ST. LOUIS.

Dutch Boy Painter Magazine, about 20 pages, published bi-monthly, in the interest of better painting, free to painters and paint dealers. Rating X and A. This magazine, besides the commercial value to the painter, contains many suggestions on painting and answers to painting problems. This is good for the school shop.

NICHOLSON FILE COMPANY, PROVIDENCE, R. I.

File Philosophy, brochure, forty-eight pages, heavy paper binding, free. Rating A.

This brochure contains a short history of the file, some safety precautions in the use, handling, and care of the file, hints regarding the proper methods of using files and the various applications of the most common files. It contains several illustrations.

Nicholson Files and Rasps and X. F. Swiss Pattern Files, sixty-four pages, illustrated, indexed, and paper bound, free. Rating X.

A File for Every Purpose, twenty-five page booklet, heavy paper binding, free. Rating A.

This booklet is written for the purpose of aiding in the use and care of files. Fine illustrations of handling and using the file for many and varied purposes are given.

NORTHERN HEMLOCK AND HARDWOOD MFG. ASS'N., OSHKOSH, WISC.

Northern Hardwoods and Softwoods their Classified Uses, twenty-eight pages, free. Rating A.

This booklet is designed to provide better familiarity with northern woods and the use to which they are put. The title designates the contents of the publication.

Home Interiors of Charm and Beauty In Enduring Northern Hardwoods, twenty-five pages, beautifully illustrated, different periods of furniture, free. Rating X.

This bulletin contains illustrations of the best type of furnishings for the home. It is suggestive of good taste.

WOODWORK (Continued)

NORTON COMPANY, WORCESTER, MASS.

Crystaldon and Diamond Wheels for Grinding Cemented Carbide Tools, forty-four pages, heavy paper binding, illustrated, free. Rating X and B.

This well illustrated booklet is very well described by its name.

Facts About Grinding Wheels, seventy-eight pages, manilla binding, free. Rating A.

This brochure does not vary from its name. It contains facts on grinding and grinding wheels, reference tables and wheel selection, and general information on grinding. The part on grinding terms is especially fitting for those who work with tools a great deal.

Norbide, thirteen pages, pamphlet, no charge. Rating X. This pamphlet deals with the 'hardest material ever produced by man for commercial use'.

Abrasive Papers & Cloths for the Student and Home Craftsman, booklet, thirty-two pages, no charge. Rating X and B. This booklet describes and illustrates how the Norton abrasive papers and cloths are made and used.

Norton Grinding Wheels for the Petroleum Industry, folder of twelve pages. Rating X.

Grinding Wheel Information and Selection, brochure, sixty-two pages, free. Rating X and A.

This brochure is illustrated and contains much specific as well as general information on selection of grinding wheels.

How to Sharpen, forty-seven pages, booklet, heavy paper binding, no charge. Rating A.

This booklet is excellent for aiding in the selection of stones, sharpening chisels, knives, scissors, razors, lawn mowers, auger bits, etc., with illustrations of the strokes needed for the best results.

Abrasives Their History and Development, twenty-seven pages, heavy paper binding, free. Rating B.

This booklet is very well explained by the title.

Correct Wheels Required for Grinding the Cutting Carbides, eight pages, free. Rating B.

This pamphlet is one on grinding practices for best results from the grinding wheels.

Norton Resinoid Wheels for Billet Grinding and for Foundry Grinding, folder, heavy paper, free. Rating X.

WOODWORK (Continued)

NORTON COMPANY (Cont.)

Grinding Wheels, general catalog, twenty-seven pages, free. Rating X.

Superfinishing with Norton Machines, Stones and Wheels, single sheet folder of six pages, free. Rating X.

Grits and Grinds, about twelve pages, published twice a year, free. Rating X.

This pamphlet is published for the purpose of keeping before the users of Norton products the latest developments in their plants.

OLIVER MACHINERY COMPANY, ST. LOUIS, MISSOURI.

Installation, Care and Operation of "Oliver" Circular Saw Benches, thirty-six pages, free. Rating A and X. This is more than a general catalog. It has the last half of the publication devoted to the safety rules, operations and jigs for operation of the circular saws. It is well illustrated and very fine for the woodworking shop.

Proper Installation and Care of "Oliver" Band Saws, six pages, free. Rating A and X. This instruction bulletin describes the installation, adjustment, lubrication, care, and safety of band saws.

Folder of Individual Descriptive Bulletins, about sixty pages, loose leaf folder, illustrations, specifications and estimates of various Oliver machines, free. Rating X.

FRANK PAXTON LUMBER COMPANY, KANSAS CITY, KANSAS.

Catalog, thirty-six pages, no charge. Rating X. This catalog lists a nice line of hard and soft woods--priced reasonably.

Wood Sample Set, forty-two samples, $\frac{1}{4}$ " x $2\frac{1}{2}$ " x $6\frac{1}{2}$ ", packed in cardboard box, price \$2.50, (sometimes sent free on request). Rating A.

This set of samples is one of the most complete that is distributed by lumber companies. The panels are worked, ready for fine sanding and finishing.

WOODWORK (Continued)

✓
 PHILIPPINE MAHOGANY MANUFACTURER'S IMPORT ASS'N. INC.
 LOS ANGELES, CALIF.

✓
Philippine Mahogany, pamphlet, sixteen pages, free.
 Rating C.

This booklet contains a good short history of mahogany. It is well illustrated with pictures of products made of Philippine Mahogany.

✓
 POPULAR MECHANICS PRESS, CHICAGO.

✓
Popular Woodturning, sixteen pages, twenty-five cents, (sent free on request), attractive cover. Rating A. This booklet contains, illustrated step by step instructions in woodturning, giving the position of the tool and hand, and kind of tool for various cuts. A few turned projects are listed near the end of the booklet.

CALIFORNIA REDWOOD ASSOCIATION, SAN FRANCISCO, CALIF.

California Redwood and its Uses, Forests Products Division, U. S. Department of Commerce, thirty pages, free. Rating A.

This bulletin, as the title indicates, deals with the history of the redwood and its uses. The illustrations showing its wide use makes the bulletin more valuable.

This is Redwood, reprinted from the redwood issue of Architect and Engineer, twenty-seven pages, very attractive paper binding, illustrated, free. Rating X and B. This brochure gives the story of cypress and its production, use, and its versatility of usage.

Lumber Letter, descriptive folder of four pages, eleven in the series, free. Rating A and X.

These folders describe redwood as to its moisture content, strength, shrinkage, shock resistance, nailing qualities, etc.

✓
 SARGENT AND COMPANY, NEW HAVEN, CONN.

✓
Wood Bottom and Iron Planes, fifty-six pages, heavy paper binding, free. Rating B and X.

This booklet contains several pages of discussion of different kinds of planes and their uses.

WOODWORK (Continued)

SARGENT AND COMPANY, NEW HAVEN, CONN.

✓
Standard Steel Squares, thirty pages, free. Rating A.
This booklet is one of the best of the steel square explanations. The rafter tables on the Sargent squares are explained. Angle cuts for polygons are also explained.

✓
Auto-Set Bench Planes, parts chart, 11½ x 18, free.
Rating A.

This chart gives the full sized parts numbered and labeled.

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION, JACKSONVILLE, FLORIDA.

American Southern Cypress, by W. LeRoy Neubrech, U. S. Department of Commerce, thirty pages, illustrated, attractive paper binding, free. Rating A.
Southern cypress is distinctly an American wood, being produced commercially only in the United States. This booklet gives the history, description of habitat and the tree itself, and the uses to which the cypress is put.

Red Cypress Repellent to Termites, six page descriptive folder, free. Rating X.

"Pecky" Cypress, What It Is--Where and How to Use it, eight page folder, illustrated, free. Rating X.

SPEEDWAY MFG. COMPANY, CICERO, ILL.

Speedway Portable Electric Tools, thirty-four pages, free. Rating X.
The catalog title designates the nature of the products handled.

STANDARD OIL COMPANY (INDIANA), CHICAGO.

The Lubrication Engineer....His Value to You, eight pages, illustrated, free. Rating X and A.
This bulletin though put out in the interests of the Standard Oil Company, contains some very vital points that should be observed and known by all who operate machinery.

✓
STANLEY RULE AND LEVEL COMPANY, NEW BRITAIN, CONN.

✓
Stanley Rafter and Framing Squares, forty-seven pages, free. Rating A.

WOODWORK (Continued)

STANLEY COMPANY (Cont.)

This booklet contains valuable information on the general use of the steel square plus suggestions for cutting rafters of all kinds. Definitions of various carpentry terms are cited.

✓ 1940 Plan Packet (25 New Project Designs), fifty cents.

Rating A.

This plan packet is well illustrated with complete drawings and directions for completing any project listed. These packets are kept up-to-date from year to year.

✓ Notebook Pages of Wood Instruction, single sheets, thirty-two pages, one-half cent each. Rating A.

The instruction sheets are very well written. Complete and full of information.

✓ Tool Guide, thirty-two pages, twenty-five parts, fifteen cents for ten or more in order, indexed. Rating A.

The title indicates the contents of this publication. Almost every hand tool in common use is mentioned with ways of using it. This publication is very good.

✓ General Catalog No. 34, 240 pages. Rating X and A.

This general catalog of the Stanley Rule and Level Plant is not only a catalog, but it contains about fifty pages of instruction sheets on the use of the tools listed. For example: Near where scrapers are listed, an operation sheet on the sharpening of scrapers is included.

✓ Stanley Wall Cards, sixteen cards, thirty-two subjects, price \$1.50 per set. Rating A.

These cards will prove a great aid in saving time and giving the student correct techniques in woodworking.

THE TANNEWITZ WORKS, SAWING MACHINERY, GRAND RAPIDS, MICH.

✓ Sawing Machinery, about seventy-five sheets of specifications and explanations, loose leaf type, attractive cover, free. Rating X.

These sheets contain a very fine list of saws and accessories.

THURSTON SUPPLY COMPANY, ANOKA, MINNESOTA.

✓ "Hard-to-Get" Materials, eighty-two pages, indexed, paper binding, free. Rating X.

A great supply of materials difficult to obtain otherwise is listed in this catalog. This is one of the largest companies of its kind in the world.

WOODWORK (Continued)

UNITED STATES RUBBER COMPANY, MISHAWAKA, IND.

Furniture Cushioning of U. S. Royal Foam, about fifty pages, loose leaf type binder, free. Rating X.
This catalog sets forth some comparatively new ideas on the use of rubber.

THE WALKER-TURNER COMPANY, PLAINFIELD, N. J.

Machine Tools for Wood and Metal, catalog C-O, fifty-one pages, general catalog, free. Rating X.

Walker-Turner Industrial Flexible Shafts, for grinding, sanding, polishing, buffing, drilling, and actual carving, twelve pages, free. Rating X.

Radial Saw and Spindle Shaper, Tools and Accessories, folder of six pages, free. Rating X.

J. D. WALLACE & COMPANY, CHICAGO.

The J. D. Wallace Company manufactures a complete line of woodworking machines, both light and production type.

WESTERN PINE ASSOCIATION, PORTLAND, OREGON.

Plan Book for the Boy Builder, sixteen pages, illustrated, free. Rating A.

This plan booklet contains a dozen, fully illustrated specifications for building things useful. The drawings and explanations are complete. The finished product is pictured.

Wood Turning in the Home Workshop, twenty-three pages, illustrated, free. Rating B.

This booklet contains the general information needed in woodturning, recommendations for tools, and more than a half dozen projects with details for constructions.

Wood Carving for Pleasure, twenty-three pages, fine illustrations, free. Rating A.

This booklet contains recommendations for the tools needed in carving, types of wood carving, and drawn projects for wood carving.

Bunk Bedroom Details, single sheet, both sides, free. Rating B.

This specification sheet shows a very attractive bedroom bunk. The plans are a bit vague, but may be followed.

WOODWORK (Continued)

WESTERN PINE ASS'N. (Cont.)

Modern Welsh Dresser Details, single sheet on both sides, free. Rating B.

The finished product is pictured. The details are simple. The project is very attractive.

Series of folders, four pages, free. Rating B.

Facts About Englemann Spruce, four page folder, free. Rating B.

This folder gives a short history of the tree and its uses.

Facts About White Fir, folder of four pages, free. Rating B.

Facts About Idaho White Pine, folder of sixty-four pages, free. Rating X.

Facts About Sugar Pine, folder of fifty-four pages, free. Rating X.

Facts About Penderoso Pine, folder of seventy-six pages, free. Rating X.

This series of folders gives the geographical location and some of the more important uses of these trees.

WOODS OF THE WORLD COMPANY, NEW YORK CITY.

Price List, twelve pages. Rating X.

This bulletin contains prices on rare and more common woods. The prices are usually reasonable.

MISCELLANEOUS TEACHING AIDS

HENRY DISSTON AND SONS, PHILADELPHIA.

Disston Pruning Guide, thirty-six pages, light paper backs, free. Rating X and A.

This booklet has thirty pages devoted entirely to pruning with the Disston pruning equipment. Shrubs, vines, fruit trees, evergreens, shade trees, and flowers and pruning them are discussed rather thoroughly. This booklet should be kept by all who are not thoroughly familiar with the art of pruning.

ELCRAFT HANDCRAFT MATERIAL DENVER.

Handcraft Handbook, No. 40, seventy-two pages, free. Rating X. This handbook is a general catalog of handicraft supplies.

MISCELLANEOUS TEACHING AIDS (Continued)

INTERNATIONAL HARVESTER COMPANY, CHICAGO.

Stop Carelessness! Prevent Accidents! Eighty-four pages, profusely illustrated, free. Rating A.

This book is to help in the great accident-prevention work being done by the National Safety organizations; the many Community and Company Safety Councils; The Red Cross; Insurance Companies; Fire Underwriters; Fire Protection Associations; and all organizations and individuals striving to prevent accidents. The photographs in this book show things as they actually are.

JOHNS-MANVILLE COMPANY, NEW YORK.

Sound Control, fourteen pages, illustrated, paper binding, free. Rating X.

This bulletin is issued for the purpose of public enlightenment on acoustical correction.

THE LINDE AIR PRODUCTS COMPANY, TULSA, OKLAHOMA.

Prest-O-Weld Axy-Acetylene Welding and Cutting Apparatus, sixteen pages, free. Rating X.

This catalog advertises a complete line of welding and cutting apparatus, goggles, flux and welding rods.

MEGOW, LARGEST HOBBYCRAFT MANUFACTURER IN THE WORLD, CHICAGO.

Catalog No. 9, toy airplane issue, illustrated, free. Rating X.

MISSELMAN PRODUCTS COMPANY, CLEVELAND, OHIO.

Cord Tires Manufacturers.

For Vehicles of Your Own Construction, eight page folder, free. Rating X.

This folder illustrates and describes rubber tires for all vehicles, including small autos, wheelbarrows, etc. Other descriptive literature on rubber tires for odd vehicles is also included.

MISCELLANEOUS TEACHING AIDS (Continued)

MORTON SALT COMPANY, CHICAGO.

Keeping In Condition by Using Salt, by P. H. Kennedy, M. D., four page folder, free. Rating X and A. This folder contains comments and answers to questions concerning fatigue of the body caused by the loss of salt from the body through perspiration. Quotations of prices on salt tablets are given.

THE H. H. PERKINS COMPANY, NEW HAVEN, CONN.

Instructions in Methods of Seat Weaving, by H. H. Perkins, 20 pages, free. Rating A. This pamphlet gives very good instructions and illustrations on weaving seats. Several different types of weaves are included in these instructions.

TENNESSEE EASTMAN CORPORATION, KINGSPORT, TENN.

Tenite, An Eastman Plastic, 28 pages, free. Rating X and B. This beautifully illustrated and attractively bound brochure pictures hundreds of articles that may be made from this plastic. A brief history and the use of plastics is printed in this publication. The unlimited range and deep colors of the finished projects attract the fancy of all. A number of small samples of Tenite will be sent free on request.

TRAFFORD MODERN MATERIALS AND DESIGN, SPRINGFIELD, MASS.

The Trafford Portfolio, forty-eight pages, twenty-five cents, usually sent free on request. Rating X and B. This booklet, as named, shows pictures of the finished products made from Trafford synthetic products. This is new, but interesting and workable.

The Trafford Handbook, twenty-three pages, free. Rating X.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

From reading the title of this thesis it will be noted that the problem deals with commercial visual teaching aids. This work has been done in an effort to compile the addresses of a large number of companies which furnish free and nearly free teaching materials to teachers of industrial arts for organized class work. The companies, whose materials are used in this thesis, are listed, with each item rated and fully annotated, in Chapter IV. A listing of all the companies who cooperated by responding to the letter of inquiry is made in Appendix C of this chapter. In this listing the names preceded by an asterisk (*) are of those companies whose materials are used in this study and correspond to those in Chapter IV.

This part of this thesis shall consist of a summary and statements of recommendations and conclusions.

The summary shall consist of a general summing up of all the contents of this thesis, with a restatement of some few particular principles.

The conclusions are a very important part of the study. They include facts and opinions as the writer sees them. They are interpretations of facts stated in the summary.

The recommendations of this thesis have grown out of the findings of the study. They are based, generally, on the statements in the summary and conclusions.

SUMMARY

1. An effort has been made to secure a large number of addresses of companies which furnish free and nearly free material to industrial arts teachers for class instruction. A total of 205 such addresses are included in Appendix C. These companies are also mentioned and marked with an asterisk (*) in Appendix C of Chapter V.
2. The advertising sections of many trade and professional magazines were examined in making the list of companies which might furnish visual teaching material for this thesis. The letter is reproduced in Appendix B.
3. The names of companies were chosen because of the title of the company or because of the contents of the advertisement.
4. The letter reproduced in Appendix B was sent to 110 companies asking for such visual teaching aids as might be available for distribution.
5. More than 200 replies were received from inquiries. (Many of the companies forwarded several copies of the original inquiry to different companies.)
6. More than 500 teaching aids are classified under thirteen industrial subjects in Chapter IV.
7. The companies who replied to the letter of inquiry but who had no materials suitable for use in this work are listed in Chapter V, without the asterisk. (*)
8. The commercial visual aids are alphabetized, annotated, classified as to industrial arts subjects, and evaluated to promote the efficiency of work and economy of time for the teacher of industrial arts.
9. The individual rating sheet was worked out with the aid of Dr. DeWitt Hunt, Head, Department of Industrial Arts Education, and Engineering Shopwork, Oklahoma Agricultural and Mechanical College, and Mr. Gary L. Hill, summer instructor, Oklahoma Agricultural and Mechanical College.
10. All material included in this thesis was received and personally examined and rated by the writer of this thesis.

SUMMARY (Continued)

11. The materials requested in the original letter of inquiry were:
 - a. Catalogs of supplies, tools, and equipment.
 - b. Information booklets, pamphlets, periodical literature, etc.
 - c. Wall charts, pictures, and posters.
 - d. Samples of products.
 - e. Demonstration materials.
 - f. Visual aids.
12. The individual items listed in Chapter IV were rated only by the writer of this thesis.

CONCLUSIONS

1. Advertising items often show only one side of a question--the facts substantiating the argument favorable to the advertiser and his products.
2. Commercial visual teaching aids should be used more because they furnish a community of experience and decrease the problem of individual differences.
3. Commercial teaching aids are good advertising for the firms who furnish them.
4. Teaching aids increase teaching efficiency.
5. That more teaching aids are being used is indicated by the increased number of companies distributing them.
6. The thirteen subject-matter fields into which industrial arts has been divided by the Oklahoma Advisory Committee are not broad enough to include all the teaching aids now being provided by industrial firms for use in the industrial arts classes.
7. Individual booklets are often more inclusive than textbooks on a particular subject because the individual booklets are made for use on a particular job or because they have more space available for detailed discussions.
8. For maximum results and longer life, the wall charts should be framed by the teacher and covered with a clear finish.

CONCLUSIONS (Continued)

9. The industrial arts teacher should have a place to store the teaching materials that will fully protect them from the light, dust, mice, etc.
10. The prospective teacher should be taught in college, in coordination with other courses, the appropriate use and care of teaching aids.
11. The commercial visual teaching aids are, almost without exception, suitable for the use for which they were made.
12. Commercial visual teaching aids are plentiful and easily obtained if teachers will apply themselves to the task of securing them.
13. The description of each item listed in this study is full enough so that it is believed that no delay will be encountered in selecting and ordering any of them.
14. Almost all the materials listed and discussed in Chapter IV are on file and open to inspection in the Industrial Arts Education office, Oklahoma Agricultural and Mechanical College, Stillwater.
15. The meager financial support given to most industrial arts shops make commercial teaching aids more necessary.
16. Industrial arts must be included as a vital part of general education.
17. Industrial arts must be planned to assume even greater responsibilities in the social and economic phases of education.
18. The present industrial arts and general education movements are not to abolish specializations, but are approached through a thorough background of generalizations.
19. Industrial arts principles and teachings are in accord with the teachings of democracy.

RECOMMENDATIONS

1. Due to the generosity of companies supplying visual teaching aids, it is recommended that industrial arts teachers make use of these materials if they are not already doing so.

RECOMMENDATIONS (Continued)

- 2. The Oklahoma advisory committee has recommended the following subject-matter fields for industrial arts: art metal work, automobile mechanics, electricity, foundry, general shop, home mechanics, industrial drawing, leather work, machine shop, photography, printing, sheet metal work, and woodworking. Due to the broadening of the industrial arts fields, it is recommended that the following be added to the subject-matter list: plumbing, heating, and ventilation; bricklaying, masonry and concrete; and welding.
- 3. It is recommended that each teacher who makes use of visual teaching aids provide a steel cabinet, or other suitable place for storing and preserving material after class use.
- 4. It is recommended that to receive the fullest benefit from commercial teaching aids, they be correlated more fully with other teaching materials and with the curriculum.
- 5. It is recommended that commercial visual teaching aids be used more in testing.
- 6. It is recommended that each industrial arts teacher in Oklahoma be supplied with a listing of commercial visual teaching aids similar to that included in Chapter IV of this thesis.
- 7. It is recommended that a program be worked out for a more definite use of commercial visual teaching aids in the industrial arts classes.
- 8. It is recommended that storage closets and bins, for the storing of visual aids, be included in plans for new shop buildings.
- 9. It is recommended that an extended library be kept in the industrial arts department of teaching aids, and that it be kept up-to-date.
- 10. It is recommended that further studies be made and that the subject-matter listings in Chapter IV be enlarged and that the commercial visual teachings aids be numerically increased.

The commercial visual teaching aids recorded in this thesis must not be considered as all there are, but will

serve as a basis for further professional study. It remains for some one else to keep these listings of companies and materials from becoming out of date. The numerous quotations, particularly in Chapter III, in this thesis indicate that visual teaching aids are being considered more worthwhile than in previous years. Particularly are more commercial teaching aids being used because of the ease with which they may be secured, and because of the financial economy in securing them.

APPENDICES

APPENDIX A

BIBLIOGRAPHY

1. Adams, T. R. Motion Pictures in Adult Education, American Association for Adult Education, New York, 1940, 94 pages.
2. Anderson, William H., "Editorial Comment", The Phi Delta Kappan 22: 232-235, January 1940.
3. Ashley, L. F. "Chronological Developments of the Industrial Arts Concept", Industrial Arts and Vocational Education, 26: 209-212, October 1927.
4. Ashley, Lawrence F., "The General On the Education Front", Industrial Arts and Vocational Education, 29: 177-180, May 1940.
5. Bawden, William T., and others, Industrial Arts in Modern Education, The Manual Arts Press, Peoria, Ill., 1934, 168 pages.
6. Bawden, William T., "The Philosophy of Industrial Arts Education", Industrial Education Magazine, 13: 178, May 1933.
7. Bonser, Fredrick Gordon, Industrial Arts for Public School Administrators, Teachers College, Columbia University, New York, 1926, 95 pages.
8. Bonser, F. G. and Mossman, L. C., Industrial Arts for Elementary Schools, The MacMillian Company, New York, 1927, 497 pages.
9. Bruce, William, Principles of Democratic Education, Prentice-Hall, Inc., New York, 1934, 382 pages.
10. Burton, William H., Introduction to Education, D. Appleton-Century Co., New York, 1939, 823 pages.
11. Clark, W. E. "Curriculum Development", The Phi Delta Kappan, 22: 260-263, January 1940.
12. Dewey, John, Democracy and Education, The MacMillian Co., New York, 1917, 434 pages.

BIBLIOGRAPHY (CONTINUED)

13. Dorris, Anna Verona, Visual Instructions in the Public Schools, Ginn and Co., Boston, 1928, 481 pages.
14. Educational Policies Commission, Education and Economic Well-Being in American Democracy, National Education Association, Washington, D. C., 1940, 227 pages.
15. Everett, Samuel, and others, A Challenge to Secondary Education, D. Appleton-Century Company, New York, 1935, 353 pages.
16. Franklin, Marion E., A Survey of Industrial Arts in the State of Oklahoma as a Basis for a Teacher Training Program, Thesis, Okla. A. & M. College, 64 pages.
17. Friese, John F., Course Making in Industrial Education; a mimeographed preliminary edition of a textbook, distributed by author, State College, Penn., 1937, 157 pages.
18. Hinderson, R. A., "Industrial Arts and Industrial Society," Industrial Arts and Vocational Education, 28: 140-142, April 1939.
19. Hoban, Charles, Hoban, Charles F. Jr., and Zisman, Samuel B., Visualizing the Curriculum, The Gordon Company, Inc., 1937, 300 pages.
20. Hunt, DeWitt, Shopwork in Engineering Divisions of State Universities and Land-Grant Colleges, Dissertation, Ohio State University, 1939, 411 pages.
21. Kilpatrick, William Heard, Education for a Changing Civilization, The MacMillan Co., New York, 1928, 143 pages.
22. Leman, Dr. Grant W., President New Jersey Visual Education Association, "Visual Aids in Education", Charles M. Higgins and Co., Brooklyn, (no date), 12 pages.
23. McRae, James L., Minneapolis, Minn., "Social Changes Challenges the Industrial Arts Program", Industrial Arts and Vocational Education, 26: 357-360, Nov. 1937.
24. Mochlman, Arthur B., Social Interpretation, D. Appleton-Century Company, New York, 1938, 485 pages.

BIBLIOGRAPHY (CONTINUED)

25. Moore, Frank C., "Trends in Industrial Arts Education", Industrial Arts and Vocational Education, 28: 137-140, April 1939.
26. Mursell, James L., Principles of Education, W. W. Norton & Co., Inc., New York, 1934, 505 pages.
27. National Youth Administration, Compiled by Russell Munn, Trade Books, National Youth Administration, Quoddy Village, Maine, 1936, 90 pages.
28. Schmidt, Fred J. Jr., "A Point of View", Industrial Arts and Vocational Education, 27: 227-231, June 1938.
29. Schweickhard, Dean M., Industrial Arts In Education, The Manual Arts Press, Peoria, Ill., 1929, 367 pages.
30. Schweickhard, Dean M., "Progressive Industrial Arts", Industrial Arts and Vocational Education, 27: 265-268, Sept. 1938.
31. Smith, Homer J., Teaching Aids for the Asking, University of Minnesota Press, Minneapolis, Minn., 1929, 62 pages.
32. Snedden, David, Vocational Education, The MacMillan Co., New York, 1930, 587 pages.
33. Struck, F. Theodore, Creative Teaching, John Wiley and Sons, Inc., New York, 1938, 623 pages.
34. Struck, F. Theodore, Foundations of Industrial Education, John Wiley and Sons, Inc., New York, 1930, 492 pages.
35. Warner, William E., Policies in Industrial Arts Education, The Ohio State University Press, Columbus, Ohio, 1928, 99 pages.
36. Weber, Joseph J., Visual Aids In Education, Valparaiso University, Valparaiso, Indiana, 1930, 220 pages.
37. Wilbur, Gordon O., "Adolescent Development", The Phi Delta Kappan, 22: 244-246, Jan. 1940.

Oklahoma
Agricultural and Mechanical College
STILLWATER

DEPARTMENT OF
INDUSTRIAL ARTS EDUCATION
AND ENGINEERING SHOPWORK

June 14, 1940

Stanley Rule and Level Plant
New Britain, Connecticut

Sirs:

Teachers of industrial arts subjects, as well as teachers of the more specific trades, are depending more and more on manufacturers for assistance in the proper use of materials, tools and machines. During the last decade, manufacturers of materials, tools and equipment used by teachers in the field of industrial education have contributed enormously to the subject matter of these fields through the production of visual teaching aids of many kinds and types. These teaching aids are becoming so numerous that it is now a difficult problem to classify them.

It is my purpose, as a part of my graduate program, to produce a complete list and a careful evaluation of much of this supplementary instructional material. The results of my study will be published as a master's thesis which will contain lists of instructional aids usable in the many industrial education subjects such as wood-working, metal working, concrete work, mechanical drawing, etc. The State Advisory Committee for Industrial Arts in Oklahoma Schools has agreed to publish this material as one of its bulletins, providing the material that I assemble seems to be of value to industrial education departments.

Will you cooperate with me in this enterprise by sending to me two copies of each of the several publications, visual aids or teaching aids that you might have available? One copy will be left in the college library. The material that I hope to receive from you might be classified under the following six headings. Catalogs are included in this list because they frequently contain informational material necessary for the courses which they represent.

1. Catalogs of supplies, tools, and equipment.
2. Information booklets, pamphlets, periodical publications, etc.
3. Wall charts, pictures, and posters
4. Samples of products.
5. Demonstration materials.
6. Visual aids.

All material listed will be indexed both under the name of the manufacturer issuing it and under the title of the course or courses in which it is most likely to be used. May I urge you to send this material immediately, as it is my purpose to complete this study during the next three months.

Please send this material to me at 412 Knoblock Street, Stillwater, Oklahoma.

Thanking you in advance for your cooperation, I am

Yours very truly,

Luther Ledbetter
Teacher of Shopwork
Tahlequah High School
Tahlequah, Oklahoma

APPROVED:

DeWitt Hunt
Head, Department of
Industrial Arts Education
And Engineering Shopwork

APPENDIX C

Alphabetical Listing of Companies Cooperating

- Abrasive Company, Philadelphia, Pa.
 * Abrasive Engineering Corp., Detroit, Michigan.
 * Abrasive Products, Inc., South Braintree, Mass.
 Addressograph-Multigraph Company, Cleveland, Ohio.
 * Adjustable Clamp Company, Chicago.
 * Allis-Chalmers, Milwaukee, Wisconsin.
 Aluminum Company of America, Pittsburgh, Pa.
 American Brake Shoe & Foundry Company, Chicago.
 * American Handicrafts Company, Los Angeles.
 American Photography Publishing Co., Boston.
 * American Screw Co., Providence, Rhode Island.
 * American Steel & Wire Co., Chicago.
 * American Type Founders, Elizabeth, N. J.
 American Floor Surfacing Machine Co., Toledo, Ohio.
 Anker-Holth Mfg., Port Huron, Michigan.
 Armstrong Cork Company, Lancaster, Pa.
 Associated General Contractors of America, Wash., D. C.
 * Atkins, E. C. & Company, Indianapolis, Indiana.
 Atlantic Abrasive Corporation, South Braintree, Mass.
 * Atlas Press Company, Kalamazoo, Michigan.
- Baer Brothers, New York City, New York.
 Bakelite Corporation, New York City, New York.
 * Balco Electric Tool & Supply Company, Chicago.
 Barber-Colman Company, Rockford, Ill.
 Bauer Mfg. Co., Wooster, Ohio.
 Beaver Pipe Tools, Inc., Warren, Ohio.
 * Binks Manufacturing Company, Chicago.
 * Birch Mfgs. Association, Oshkosh, Wisconsin.
 * Black & Decker Portable Electric Tools, Towson, Md.
 * Boice-Crane Company, Toledo, Ohio.
 Brodhead-Garrett Company, Cleveland, Ohio.
 Bruce Publishing Company, Milwaukee, Wisconsin.
 * Bruning, Charles, Company Inc., Kansas City, Mo.
 * Bryant Electric Company, Bridgeport, Conn.
 * Buck Brothers, Millsbury, Massachusetts.
 * Buffalo Forge Company, Buffalo, New York.
 Bullard Company, San Francisco, California.
- * California Redwood Association, San Francisco, Calif.
 * Campbell Company, Kansas City, Mo.
 * Carborundum Company, The, Niagara Falls, N. Y.
 * Casein Company of America, New York.
 Celotex Company, Chicago.
 Chaffe, W. J., Company, Chicago.
 * Chicago Wheel & Mfg. Company, Chicago.
 Cincinnati Milling Machine Co., Cincinnati, Ohio.

Alphabetical Listing of Companies Cooperating (cont.)

- * Cincinnati Tool Company, Cincinnati, Ohio.
- Clemson Bros. Inc., Middletown, N. Y.
- Cleveland Twist Drill Co., Cleveland, Ohio.
- Cole Radio Works, Caldwell, N. J.
- * Colorado Fuel & Iron Corp., Denver, Colo.
- * Columbian Vise and Mfg. Co., Cleveland, Ohio.
- Columbian Rope Company, Auburn, N. Y.
- Compressed Industrial Gases, Chicago.
- * Continental Machines Inc., Minneapolis, Minn.
- Copper & Brass Research Association, N. Y.
- * Craftsman Wood Service Co. Chicago.
- * Crescent Machine Company, Leetonia, Ohio.
- * Crown Spray Gun Mfg. Company, Los Angeles.

- * Delta Mfg. Company, Milwaukee, Wisc.
- * Detroit Macoid Corp., Detroit, Michigan.
- * DeVilbiss Company, Toledo, Ohio.
- DeWalt Products Corp., Lancaster, Pa.
- Dick, A. B., and Company, Chicago.
- * Dietzgen Company, Chicago.
- * Disston, Henry, & Sons, Philadelphia, Pa.
- Dodge, C. B., Company, Westport, Conn.
- Dry-Zero Corporation, Chicago.
- Ducen Sales Company, Detroit, Mich.
- DuPont Company, Inc., Chicago.

- * Eastman Kodak Company, Rochester, N. Y.
- Egyptian Lacquer Mfg. Co., New York.
- * Elcraft Handicraft, Denver.
- * Electric Storage Battery Co., Philadelphia.

- Fairbanks, Morse & Company, Chicago.
- * Fay, J. A. & Eagen Co., Cincinnati, Ohio.
- * Ferdinand, L. W. & Co., New York City.
- * Ferro Enamel Corp., Cleveland, Ohio.
- * Field, Alfred & Co., New York.
- Fisk Bros. Refining Co., Toledo, Ohio.
- Flexrock Company, Philadelphia, Pa.
- Ford, Henry, Trade Schools, Dearborn, Mich.

- Gallmeyer & Livingston Co., Grand Rapids, Michigan.
- * Gardiner Metal Co., Chicago.
- * General Motors Corp., Detroit, Michigan.
- Goodrich, F. B. Company, Akron, Ohio.
- * Grand Rapids Wood Finishing Co., Grand Rapids, Mich.

- * Hall, W. A., & Son Fancy Leathers, Boston.
- Hammett, J. L., Company, Cambridge, Mass.
- Hammond Machinery Builders, Kalamazoo, Michigan.
- Hannifin Manufacturing Co., Chicago.

Alphabetical Listing of Companies Cooperating (Cont.)

- * Harbor Plywood Corp., Hoquiam, Washington.
- * Haskins, R. G., Company, Chicago.
- * Hassell, John, Inc., Brooklyn, New York.
Hazard Insulated Wire Works, Chicago.
- * Higgins, Chas. M. & Co. Inc., Brooklyn, New York.
Hilo Varnish Corp., Chicago.
Home Craftsman, The, New York.
- * Huther Bros. Saw Co., Rochester, N. Y.

- Ideal Commutator Dresser Co., Sycamore, Ill.
- * International Harvester Co., Chicago.
- International Textbook Co., Scranton, Pa.
- * Irwin Auger Bit Co., Wilmington, Ohio.
- I-T-E Circuit Breaker Co., Philadelphia, Pa.

- * J. & H. Metal Products Co., Rochester, N. Y.
- * Jackson Electrode Holder Co., Detroit, Michigan.
- Jenkins Bros., Atlanta, Ga.
- * Johns-Manville, N. Y.
- Johnson, S. C. & Son, Racine, Wisc.
- Just-Right Mfg. Company, Chicago.

- Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
- Kent-Owens Machine Co., Toledo, Ohio.
- * Kester Solder Company, Chicago.
- * Keuffel & Esser Company, St. Louis.
- * Keystone Glue Company, Williamsport, Pa.

- * LeBlond, R. K. Machine & Tool Co., Cincinnati, Ohio.
- Lamb, George N., Chicago.
- * Papcheske Leather Company, Des Moines, Iowa.
- Larkin Air Vise Company, The, Portland, Conn.
- * LePage's Adhesives, Gloucester, Mass.
- * Lincoln Electric Company, The, Cleveland, Ohio.
- * Linde Air Products Company, The, Tulsa, Oklahoma.
- Lindsley Mfg. Company, The, Bridgeport, Conn.
- Lowe Bros. Company, Dayton, Ohio.
- * Lufkin Rule Company, Saginaw, Michigan.

- Mall Tool Company, Chicago.
- * Manual Arts Press, Peoria, Ill.
- * Masonite Corporation, The, Chicago.
- Maydole Hammer Company, Norwich, New York.
- McKenna Metals Company, Latrobe, Pa.
- * Megow, Largest Hobbycraft Mfg. in the World, Chicago.
Megow, Philadelphia, Pa.
- * Millers Falls Co., Greenfield, Mass.
- * Misselman Products, Cord Tires, Cleveland.
- * Monite Waterproof Glue Co. Minneapolis, Minn.
- * Morton Salt Company, Chicago.
- Mummert-Dixon Company, Hanover, Pa.
- MuSwitch Corporation, Canton, Mass.

Alphabetical Listing of Companies Cooperating (Cont.)

- National Board of Fire Underwriters, Chicago.
- * National Carbon Company, New York.
 - * National Lead Company, St. Louis.
 - National Lumber Manufacturers' Ass'n., Washington, D. C.
 - * National Twist Drill Company, Detroit.
 - Niagara Machine & Tool Works, Buffalo.
 - * Nicholson File Company, Providence, R. I.
 - * North Bros. Manufacturing Co., Philadelphia, Pa.
 - * Northern Hemlock & Hardwood Mfg. Ass'n., Oshkosh, Wisc.
 - * Norton Company, Worcester, Mass.
- Okonite Company, Chicago.
- * Oliver Machine Company, St. Louis, Mo.
 - * Osborn Bros. (Leathercraft), Chicago.
 - * Osborne Mfg. Company, Cleveland.
 - Ozalid Corporation, Johnson City, New York.
- Packwood, G. H., Mfg. Company, St. Louis, Mo.
- * Paxton, Frank, Lumber Co., Kansas City, Kansas.
 - Pease, C. P., Company, Chicago.
 - Perkins Glue Company, Lansdale, Pa.
 - * Perkins, H. H., Company, New Haven, Conn.
 - * Pexto: The Peck, Stow & Wilson Company, Southington, Conn.
 - * Philippine Mahogany Import Ass'n., Inc., Los Angeles.
 - Pittsburgh Saw & Tool Co., Pittsburgh, Pa.
 - Popular Home Craft, Chicago.
 - * Popular Mechanics Press, Chicago.
 - * Pyott Foundry & Machine Company, Chicago.
- * Radio Wire Television Inc., New York.
- * Reed-Prentice Corp., Machine Tools, Worcester, Mass.
 - Reliable Gas Products Co., Cedar Rapids, Iowa.
 - * Rhodes, J. E. & Sons, Philadelphia, Pa.
 - Richardson, The Company, Melrose Park, Ill.
 - Ruberoid Company, Chicago.
 - Russell Electric Company, Chicago.
- * Sargent & Company, New Haven, Conn.
 - Sears, Roebuck and Company, Kansas City, Mo.
 - Silk Screen Supplies, Brooklyn, New York.
 - * Simonds Saw and Steel Company, Fitchburgh, Mass.
 - * Skybrite Company, Cleveland, Ohio.
 - Smith, Landon P., Inc., Irvington, New Jersey.
 - * South Bend Lathe Works, South Bend, Indiana.
 - * Southern Cypress Manufacturers' Ass'n., Jacksonville, Fla.
 - * Speedway Mfg. Company, Cicero, Illinois.
 - Sta-Warm Electric Company, Ravenna, Ohio.
 - * Stanley Rule & Level Company, New Britain, Conn.
 - * Standard Oil Company, Chicago.

Alphabetical Listing of Companies Cooperating (Cont.)

- * Sterling Wheelbarrow Company, West Allis, Wisconsin.
- Sugar Beet Products Company, Saginaw, Michigan.
- * Synthane Corporation, Oaks, Pa.

- Talens & Son, Ltd., Irvington, New Jersey.
- * Tannewitz Works, The Sawing Machinery, Grand Rapids, Mich.
- * Tennessee Eastman Corporation, Kingsport, Tenn.
- Thomas Publishing Company, New York.
- * Thurston Supply Company, Anoka, Minn.
- * Trafford Modern Materials and Design, Springfield, Mass.

- United States Blue Print Paper Co., Chicago.
- United States Electrical Tool Co., Cincinnati, Ohio.
- * United States Rubber Company, Mishawaka, Indiana.

- * Walker-Turner Company, Plainfield, New Jersey.
- * Wallace, J. D., & Company, Chicago.
- * Wallace Supplies Mfg. Company, Chicago.
- * Western Pine Association, Portland, Oregon.
- * Western States Envelope Company, Milwaukee, Wisc.
- * Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.
- Weston Electrical Instrument Corp., Newark, New Jersey.
- * Weyerhaeuser Sales Company, St. Paul, Minn.
- * White Metal (Pewter) Rolling & Stamping Corp., Brooklyn.
- * Wilder & Company, Chicago.
- * Wood of the World Company, New York City.