THE USE OF PROJECTED PICTURES FOR INDUSTRIAL ARTS TEACHING

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A Report

by

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U. T. O.

Dedicated to my Daughter

Pamela Jo

TABLE OF CONTENTS

CHAPTER		PAGE
I.	The Phases of Study	1
	Description of the Problem	1
	Need for the Study	2
	Use of the Study	2
	Limitations of the Study	2
	Review of Previous Studies	3
	The Barefoot Study	3
	The Beckham Study	4
	The Charters Study	5
	The Fulton Study	6
II.	Development of Visual Education and Industrial Arts	8
	Part A Philosophical and Historical Study of Visual Education	8
	History of Visual Education	8
	Definition of Visual Education	10
	Part B How Industrial Arts Progressed as a Secondary School Subject	11
	Early Industrial Education	12
	Development of Manual Training	12
	The Manual Arts Era	13
	The Industrial Arts Period	14
	Definitions of Industrial Arts	14
	Important Objectives of Industrial Arts in Public Schools	15
III.	The Evaluation of a Selected Motion Picture	17
	Part A Standards for Evaluation	18
	Read Description of Individual Films	18
	Titles	18
	Scenes	18
	Primary Objective	18
	Subject - Matter and Grade Level	19
	Motivating Qualities of a Film	19
	Understanding the Purpose for Which the Film Was Produced	19
	Content of Film	20
	The Quality of the Motion Picture	20
	The Motion Picture Must be Authentic	20
	Effect of a Film Upon Personal Attitudes	20
	Technical Excellence of the Film	20
	Financial Investment	21
	Preview the Film	21
	Part B The Need of Objectives	22
	Instructional Objectives of the Good Educational Film	22
	Part C Evaluating a Motion Picture	23
	A Method for Evaluating a Film	23
	Criticisms of the Film	30

TABLE OF CONTENTS (Continued)

CHAPTER PAGE

IV. Methods of Showing Films and Slides for Use in Industrial Arts Classes 32
Part A Film Strips 32
Sizes. 32
Advantages 33
Making Film Strips 33
Cost Factors 33
Part B Educational Motion Picture. 34
Types of Motion Picture Film 34
Advantages of Motion Pictures. 35
Cost Factors 35
Part C Lantern Slides. 36
Sizes. 36
Why the Use of Still Pictures Has Increased. 36
Making Lantern Slides. 37

V. Education Films For Use in Industrial Arts 38
Part A Names of Oklahoma Colleges Furnishing Educational Films and Film Strip. 38
Audio-Visual Education, Extension Division, University of Oklahoma, Norman, Oklahoma. 38
Department of Audio-Visual Education, Central State College, Edmond, Oklahoma. 40
Division of College Extension, Audio-Visual Center, Oklahoma A. and M. College, Stillwater, Oklahoma 41
Film Library, East Central State College, Ada, Oklahoma. . 42
Film Loan Library, Northeastern State College, Tahlequah, Oklahoma. 43
Film Loan Library, Southeastern State College, Durant, Oklahoma 43
Film Loan Library, Extension Division, Southwestern Institute of Technology, Weatherford, Oklahoma 44
Part B A Recommended List of Films for an Industrial Arts Program. 45
A One-Year Cycle in Showing Films. 45
Part C Educational Films for Industrial Arts Classes Arranged by Subjects. 46
Automobile Mechanics 47
Mechanical Drawing 47
Woodworking. 50
General Shop 51
Electricity 51
General Metal Work. 53
Machine Shop. 55
Welding 55
Concluding Statements. 56

A Selected Bibliography. 58

CHAPTER I

THE PHASES OF STUDY

There are many film catalogs giving lists of educational motion pictures, film strips, and slides, but when one attempts to find appropriate pictures for showing before industrial arts classes, it seems that there are few films available. It is not the purpose of this report to duplicate any of the film lists of national distributors of educational films. The purpose is, however, to provide the reader with a list of useable films that can be obtained from Film Loan Libraries of State Colleges of Oklahoma. A serious need has existed for several years for a source list from which industrial arts teachers can secure films within the state in which they teach. The list of films arranged under the proper subjects appears lengthy but will be fairly complete for any person seeking a particular film on some phase of a certain industrial subject.

Description of the Problem: The need for reliable and accurate lists of films and slides, useable in school shop classes, which can be obtained from the State Colleges of Oklahoma, led to the selection of this problem as a subject for a report. In the solution, many steps of research were necessary to complete this study. The lists of motion pictures, film strips, and slides which were available to the writer were not classified as to the subjects in which they are useable. The selection and grouping of the films that contributed to industrial arts subjects, with names of sources from which they could be obtained, was one of the problems met. The writer, in dealing with the problem, has attempted to secure all available and up-to-date films which pertain to industrial arts that have been

made available to the public by the State Colleges.

Need for the Study: Until recently, the use of films was not so extensive in the teaching of shop classes. It is especially valuable in bringing to the students certain aspects of industry which cannot readily be seen at first hand. By this means, the pupils may see skilled tradesmen at their tasks and observe machinery and industrial equipment in use.

Many teachers of shop classes do not have lists of films that will aid them in teaching their classes most effectively. At present, no list of films is to be found that combines all the films useable in shop classes. The film loan libraries in Oklahoma do not have their films classified according to industrial arts subjects. The heading under which they come is too general for the immediate use as related material to shop subjects.

Use of the Study: The film list included in this report may be used by the teachers of shop classes or those interested in industrial arts shop classes. The films could be used in vocational guidance courses to give the pupils an insight into a number of vocations. The list will serve as a guide for those wishing to use motion pictures or slides as related material in their teaching. In providing a list of film loan libraries, the teacher will be able to correspond with the supervisor of the library, particularly if he is anxious to obtain lists of currently available films.

Limitations of the Study: Projected teaching aids for educational classes are numerous. Administrators of schools have seen the value of visual aids in education but have been slow in purchasing the equipment necessary to promote an audio-visual program in the schools. The films or slides obtained from manufacturers often contain much advertising for the benefit

of the company. In view of the points just mentioned and due to the purpose of this report, certain limitations have been adopted. The projected teaching aids were limited to the methods of sound film, silent film, and slide projection.

There are several reasons for not including all available sources of educational film. The first is that previous studies have listed the distributors within the United States. A second limit is the small available departmental budgets allowed for a majority of industrial arts teachers. The limitations of this study were necessary so as to provide for the effective collection, organization, and interpretation of the data on the problem.

Review of Previous Studies: A necessary step in preparing this study was reviewing similar studies in the field of visual education and its relation to the teaching of industrial arts in secondary schools. In reviewing previous and similar studies, the writer was interested in finding the purposes for which the previous studies were made, the extent in which the study covered the discussion of films, and the recommended visual aids in teaching industrial arts.

The Barefoot Study: Olen G. Barefoot completed his master's thesis in 1939 entitled Audio-Visual Aids in Public Schools.(2) In this study, 8,806 schools and school systems were surveyed. This survey showed that in these schools 37,671 instruments for projection of pictures, 11,501 radio receiving sets, nearly a thousand centralized sound systems, three-quarters of a million phonograph records, and more than three million glass slides were being used. Very little attention was given to 35mm motion picture projectors because of their higher cost over the 16mm projector. A short history of

the use of the phonograph record for instructional purposes and of the radio and its place in the schools was given. Something of the use of the sound slide film is discussed by the writer in which it is stated that still pictures are printed on 35mm positives for projection by use of a film slide projector.

The writer advised those educators who are hesitating in buying or securing radio or motion picture equipment for use in their schools from fear of the development of television, could dismiss their fears and proceed with reasonable assurance that any modern equipment which they install will be extremely useful for many years to come.

The writer summarized the thesis with ten factors to be considered when contemplating purchase of a projector. They are the following:

1. Intensity of illumination
2. Safeguards against film damage
3. Steadiness of the picture projected
4. Quality of sound
5. Ease of operation
6. Portability
7. Durability
8. Accessibility to repair services
9. Accessories
10. Cost

The Beckham Study: Wick G. Beckham completed his master's thesis in 1940 entitled Use of Opaque Pictures in Visual Education.(3) The writer gives a brief description and history of visual education. A survey was made to

see how many teachers in Oklahoma public schools used pictures in their teaching. The writer surveyed students who were attending summer school, which included superintendents and principals as well as classroom teachers.

Beckham submitted 116 questionnaires to instructors of audio-visual education, of this number, sixty-six were returned. The survey showed that there were three courses offered which dealt only with the production of visual aids in teaching. Fifty-two courses offered were devoted partly to the production of visual aids. Forty instructors expressed their belief that a course should be given in teacher training institutions covering the production of visual aids.

The writer concludes his thesis with the following statements: (1) The principle reason that opaque pictures are not used more extensively by the teachers in Oklahoma schools is that they have not been informed as to the abundance of materials which they may obtain for use in their classroom. (2) A course in the production of opaque pictures should be a part of the training of every teacher.

The Charters Study: While this study is not a thesis, the small publication Motion Pictures and Youth,[7] which was written by W. W. Charters in 1933, has influence on all later studies of the uses of motion pictures in school classes.

The writer made a study on the effects that motion pictures had upon the youth who saw them. A number of pictures were seen and data were taken from different effects that the picture had upon children and youth of all ages. These principle effects were classified under these headings: information, attitudes, health, and conduct. Several pictures were viewed by

superior adults and children ranging from five to ten years of age. The amount of information retained by the two groups is given in percentages. It shows that young children retain fifty to sixty percent of what they see.

The study brings out the fact that children of all ages tend to accept as authentic what they see in the movies. In attitudes, the children were influenced by motion pictures, causing them to try to duplicate things they saw on the screen. The emotions of the students were affected quite noticeably by the movies. Those from five to ten years of age were influenced by fear or horror types of pictures and were not influenced by pictures pertaining to love. The pupils influenced by love scenes were from fifteen to nineteen years of age. The older pupils and adults were less affected by influences in the pictures.

The Fulton Study: W. R. Fulton, in 1939, completed a thesis entitled Problems in Administration of Projected Visual Aid Based on Industrial Data.(12) The author made a study of the number of projectors in the Oklahoma public schools. Another phase of the study presents the reasons why there are not more films and projectors used in the public schools. Some of the reasons are: (1) lack of finances, (2) lack of knowledge on the part of the school boards and superintendents concerning many uses of films in school work.

Companies, agencies, and firms that distribute visual aid materials and other equipment needed for visual education are listed. The approximate cost of various machines are given, with recommendations as to sizes and uses to which they are to be placed. Photography, listed by colleges as a course taught, is indicated by a table.

Most of the information included in this thesis was obtained by means of a questionnaire addressed to county superintendents, high school superintendents, and presidents of institutions of higher learning. Also included are tables showing the cost, film, and sizes of various machines.

The fact that these studies, and others not mentioned, have not discussed or listed films that can be obtained from the film loan libraries in Oklahoma. The need for the use of these films in teaching industrial arts classes is ample proof that such a study is appropriate and needed. An extended search of research studies has failed to reveal theses titles dealing with this topic.

CHAPTER II

DEVELOPMENT OF VISUAL EDUCATION AND INDUSTRIAL ARTS

Industrial arts teachers should use visual aids for two purposes. First, for giving information and help in the development of skills. Secondly, the appearance of the shop could be enriched and made attractive by the judicious use of pictures, mock-ups, charts, and models. These aids will furnish the stimulus for the student to refer to textbooks and library for further information and help on the industrial subjects that the visual material cannot give.

Part A Philosophical and Historical Study of Visual Education

The principal purpose of visual education is to assist in the formation of concrete imagery when verbal imagery is insufficient or impossible for the student to understand. Many classroom lectures would be understood more clearly and readily if the discussion were illustrated by some well chosen pictures concerning the lecture. The picture gives something to see and provides the material for concrete imagery.

History of Visual Education: The use of pictures in education is nearly as old as education itself. It is known that primitive people used gestures and signs as a means of communication until speech was discovered. These methods of communication proved useless however when records for future use were needed and when distance separated those desiring to communicate. The desire to overcome these limitations of time and space led the primitive man to draw pictures. The inscription found on the walls of the primitive man's cave gives proof that pictures were used frequently as a means of record and communication.

The pictures the cave man made were flat and portrayed only two dimensions, breadth and width. Artists learned, many years later, to show the third dimensions by shading and making the objects in the background smaller than the objects in the foreground. Later, came hieroglyphics and centuries later the varied forms of the alphabets which were used on clay tablets and papyrus. Expression became more difficult to understand as it developed from the simpler forms of the primitive man.

Visual aids in formalized education have been used for centuries by using sand, boards, and slate on which marks and diagrams were drawn. Reproduction of drawings was made possible as printing was developed. In 1659, Comenius "Orbia Pictus," the first illustrated textbook was printed followed by the "New England Primer" in 1690. Photography invented in the Nineteenth Century by Niece and the development of the engraving processes by Daguerre increased the possibilities of utilizing illustrative materials in books and other forms for classroom purposes.

The process of developing pictures unaffected by light was discovered by Nicephore de Niece. The process consisted of coating the surface of a metallic plate with a solution of asphatum in oil lavender, and then it was gently heated. A polished plate was covered with varnish, and when dried, was ready for employment in the camera.

The first photograph was produced in England by using chloride of silver exposed to sunlight. In 1892, Wedgwood remarked in an article which was published in the Journal of the Royal Institute that white paper, moistened with a solution of nitrate of silver, undergoes no change when it is kept in a dark place; but when it is exposed to light, it speedily changes color and after passing through various shades of brown and gray, it becomes

nearly black. (16, page 1)

Motion picture development was first started in 1872. Thomas A. Edison invented the kinetoscope in which tiny pictures were mounted spirally on a cylinder and were viewed as in motion. In 1889, the Eastman Kodak Company developed the photographic film which was used for lantern projection. The first demonstration of lantern projection used in photographic film was given by Edison in his laboratory, October 6, 1889.

Pictures are projected through a mechanism that is much on the same principle as the older magic lantern projector. The pictures which come on 8, 16, and 35mm film pass so fast through the projector that motion is seen on the screen by the observer, thus, getting the name motion picture.

Investigation and experiments are still being conducted in the field of visual education. Improvements are surpassing the sound and motion picture in such inventions as the talking book, television, and the three-dimensional sound. The future development of these and similar devices will give the boys and girls more educational opportunities in the form of visual instruction. (16, page 6)

Definition of Visual Education: Visual education can never be thought of as a separate subject, but is the application of any of the visual materials to the improvement of the teaching technique. The definition of visual education by Roberts helps to clarify any misinterpretations. (19, page 212)

> Visual education is a method of imparting information which is based upon the psychological principle that one has a better conception of the thing he sees than of the thing he reads about or hears discussed.

Visual instruction is adequately explained in the definition from Dorris. (9, page 6)

> Visual instruction simply means the presentation of knowledge to be gained through the seeing experience.

Visual sensory aids facilitate the understanding of the written or spoken word. These aids are supplementary devices by which the teacher helps to clarify and correlate accurate concepts, interpretations, and appreciation.

Visual instruction, as stressed by Doctor P. Dean McClusky, is only that part of instruction gained through the see experience. (15, page 62)

> Visual instruction emphasizes the values of concrete imagery in learning while other instruction stresses the importance of verbal imagery.
>
> Broadly speaking, visual education is not of course a separate subject nor even a new procedure in the teaching process. It is merely a means to an end. Visual instruction simply means the presentation of knowledge to be gained through the seeing experience has always been man's simplest and most natural means of gaining information.

Recent investigations have shown that 85 percent of what was learned was not learned through the eyes as formerly believed. This percent is too high for visual instruction without other senses also important to learning. Visual and sensory aids are not designed to replace present methods of instruction but to supplement and modernize these methods.

Part B How Industrial Arts Progressed as a Secondary School Subject

Industrial arts may be thought of as a part of general education in that it deals with certain materials and ways of manufacturing products for the consumers. By using these materials and manufacturing products

from them, the high school student has a chance to obtain varied experiences. With these varied experiences, the student is gradually transferred through many different steps in his educational development. One of the many advantages that industrial arts education has that other school subjects do not have is that it may be applied to many levels of education. With our present day civilization and its many different types of occupations, industrial arts education is giving the pupils who take general shop courses a chance to learn something of many occupations.

Industrial arts is far from being of recent origin. It has existed in an unorganized way since the beginning of civilization. Written records do not go back as far as industrial arts in prehistoric days nor do we have complete records of industrial arts in ancient and medieval times. The activities in industrial arts in times of early civilization were spent chiefly in providing shelter, securing food, and making clothing.

Early Industrial Education: The earliest written records that are on file disclose that some forms of apprenticeship existed among Egyptians, Babylonians, Greeks, and Romans. Apprenticeship was an important phase of the craft guilds which were established during the Renaissance period and brought forth literature, architecture, arts, and industrial arts. Education in the United States has advanced from the apprenticeship type to the free public school with compulsory attendance for children. Labor unions and employers associations have come to influence education in the schools.

Development of Manual Training: Manual training in the Nineteenth Century was a direct result of the cooperation of educators, employees, and employers. The desire was for a form of industrial education not stressing a specific

trade in the public schools curriculum. Manual training in the United States was inspired by exhibits at the Centennial Exposition at Philadelphia in 1876, these coming from Russia and Sweden. Calvin M. Woodard, of the Engineering Department of the Washington University at St. Louis, Missouri, and Professor John D. Runkel, at that time president of the Massachusetts Institute of Technology, saw these exhibits and definite action was taken in their institutions to promote such a form of education. In the Massachusetts Institute of Technology, which was established in 1864, a practical shopwork course was desired and a program was initiated. This program was later abandoned because of the Mechanic Arts High School that was established in 1878.

The Manual Training School of St. Louis, Missouri, was established June 6, 1879. The Chicago Manual Training School was established in 1884. Cleveland, Baltimore, and Toledo introduced manual training in 1884. (1, page 347)

The Manual Arts Era: The influences of the Russian hand work, Swedish Sloyd, and Arts and Crafts merged into one to become Manual Arts. The basic purpose of this new trend was the making of useful and well designed articles or projects. Manual arts was soon correlated with the other subjects and became in reality an integral part of secondary schools. When manual arts was broadened and enriched, in keeping with the principles of industrial arts as developed during the early decades of the present century, the project idea was carried over into the new program. The teachers of manual arts also felt the influences of the three types of training when they merged into one. It made the teachers more aware of such things as good taste, beauty in simplicity, artistic ideals, originality in design, and honest construction. (26, page 145)

The Industrial Arts Period: The enlarged field of industrial arts has developed from the fields of manual training and manual arts. Although much different from vocational industrial, both fields have their place in a complete education program that serves current social needs. It is desirable to understand the differences and relationship between industrial arts. The term "practical arts" includes instruction in subjects as follows: industrial arts, household arts, and similar forms of non-vocational education. Industrial arts was originally justified on the basis of training of the hand and eye of the student.

Definitions of Industrial Arts: Industrial arts includes many of the methods and techniques of manual training with many other ideas and concepts added. These definitions are offered in order to clarify the concepts represented by special terms used in the industrial education field.

In the Oklahoma state course of study for hand woodworking, there is the following definition of industrial arts. (22, page 1)

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

Bonser in his book Industrial Arts for Elementary Schools gives the following definition. (4, page 5)

> Industrial Arts, is a study of changes made by man in the form of materials to increase their value, and of the problems of life related to these changes.

Industrial arts from the definitions given can be recognized as an agency of the public. Its values in general education make it indispensable in all levels of life. Industrial arts is an intergal part of education of the youth and should be required of all students from the elementary school to adult education.

Important Objectives of Industrial Arts in Public Schools: The important objectives of industrial arts in the public schools are primarily those objectives that contribute to the broadening of the general education of the pupils in industrial activities that might be encountered in later life. It is the purpose of industrial arts in the schools curriculum to offer try-out courses for the pupils, to see if their interest continues. These try-out courses are a great help to the student in deciding upon a vocation. The real objectives of industrial arts should be then to provide useful and meaningful experiences.

The general objectives of industrial arts as worked out by graduate students majoring in Industrial Arts Education at Oklahoma Agricultural and Mechanical College were as follows. (13, page 12)

1. Provides basic industrial knowledge, useable and essential in every day life.
2. Trains in problem solving of job analysis type. (Problems met in daily activities are very similar.)
3. Home mechanics (handy man ability) is developed so that a boy can do ordinary repairs in and around the home.
4. Exploration into basic trades will result in general educational values of a broadening nature.
5. Skills in use of tools develops attitudes of exactness and carefulness.
6. Consumers knowledge and appreciation, useful in selecting, operating, and maintaining services and products of industry will be attained.

7. Avocational training consisting of detecting and developing interests and abilities leading to a hobby may be a product.

8. Guidance values should come from a knowledge of several crafts and trades.

9. Vocational training of varying degrees in a uniform outcome.

10. Socialized values wherein the boy becomes skilled in personal and social relations are direct outcomes.

11. Provides an outlet for boy interests. Interest may be of brief durations but should be given an opportunity of expression.

12. Health values are apparent in the opportunity provided for physical activities.

13. Mechanical drawing. It is use and importance in modern life are learned.

14. Safety First. Provides for basic attitudes and practices that are valuable in surviving the dangers of the modern era.

All objectives in education, whether it be those courses having to do with academic work or those having to do with industrial and mechanical pursuits, have, in general, the goals set forth by the seven cardinal principles of education. The objectives, in a course of study, may also serve as a check to see if the teacher is meeting the conditions, purposes, and giving the necessary information to the pupils.

CHAPTER III

THE EVALUATION OF A SELECTED MOTION PICTURE

The first step for the teacher who is considering the use of a film in teaching a unit of instruction is to analyze the content of the film. In this way, there can be determined the content of the film which relates to the objectives of the unit, the organization of the content, the important aspects of the film which should be studied by the pupils, and the relation of the film to other teaching aids, reading assignments, etc. The making of such an analysis forces the teacher to a thorough study of the film, and from this study by the teacher there should develop a definite idea of procedure appropriate to study by the pupils. After a film has been analyzed for instructional relationships, it should be evaluated. The analysis has furnished one important element of evaluation, its relation to a unit which must be considered before acceptance as an instructional tool.

The best test of an educational film is in terms of evaluation of the pupils growth or its contributions to the child's ideas, knowledge, and habits. Test of both the subjective and objective type can be used to determine its contributions. The results of pretest compared with those of other tests given after the final showing of the film will be helpful in evaluating it. The reaction of the students in the follow-up activities is indicative of the value as a teaching aid. Generally, pupils opinions will also be valuable. It is safe to assume that the contribution that the film makes is in direct proportion to the planning of the teacher and the preparation of the pupils.

Part A Standards For Evaluation

The selection and evaluation of educational motion pictures are inseparably linked with the curriculum, utilization, administration, and the production of improved educational films. Selection and evaluation; what are they? "Selection: to take from a large number by preference." "Evaluation: to find and fix the value of." When taken from a larger number by preference, this preference must have some basis. An evaluation must be made to determine what the preference shall be. In making a selection, a person should make these two decisions: (1) whether or not to use a film in a particular classwork setting and (2) if advisable to use a film, a choice of the one considered most suitable.

The following are pertinent in evaluating a motion picture:

1. Read description of individual films. It is advisable to read the description of individual films given in the catalogs and descriptive literature to formulate some idea of the content of the film. It is furthermore wise to solicit the experiences and recommendations of users and producers of films when forming tentative decisions as to which would best fit a particular program. (25, page 236)

2. Titles. Titles should be evaluated in terms of the comprehension of pupils at the grade level for which the film is used.

3. Scenes. Scenes should be in logical and in an understandable sequence. First things should come first.

4. Primary objective. The primary objective should be determined and the film evaluated in terms of that objective. In the best film, all scenes will contribute toward the primary objective and irrelevant scenes would be eliminated. (14, page 132)

5. Subject - matter and grade level. Can the subject matter be correlated and integrated with the course of study for a particular subject and a specific grade level? Many teachers look upon the film as something set apart from their regular teaching materials. Consequently, much of the value is lost unless it is of such a nature that it can be correlated with the course of study. A number of publishers now include the titles of motion pictures that may be correlated with their textbooks. The film should fit in with other visual aids; such as, maps, charts, posters, slides, that are normally used in developing a unit of work or a particular lesson. In addition, the pictures should be such that the pupils in the grade in which they will be used can easily understand them. (17, page 230)

6. Motivating qualities of a film. A film that is a "closed and forgotten book" when the students have seen it is usually an inferior educational picture. A good educational motion picture leaves the student with a desire to learn more about the material portrayed. (14, page 131)

7. Understanding the purpose for which the film was produced. An educational film may be authentic in every respect, and yet the students may misinterpret it unless they are familiar with the purpose for which it was produced. Suppose a film has been made to emphasize the need for better housing units in a particular rural area or in a specific zone in a city. The photographer may select the poorest housing units in order to make the need for better housing more striking. If, however, the students may get the idea that the house pictured is typical of all rural or urban areas, then the film, even though authentic, has been detrimental because its function was not understood. The instructor should understand, and see that the class understands the purpose for which the film was made. (17, page 231)

8. Content of film. Irrelevant facts or episodes, even though they may be interesting, add nothing but useless expense to an educational film. In fact, they may distract from the main thought. (17, page 232)

9. The quality of the motion picture. Pictures that are not sharp, clear, and distinct represent a poor educational investment. Good pictures attract, that is, they are pleasing to view. Since an unattractive picture fails to interest the learner; it discourages learning.

10. The motion picture must be authentic. The large majority of films are authentic. The subject matter and content must be passed by the research staff or collaborator before the film is released to the public. This means that the work of some of the best known educators and leaders can be brought into the classroom. Two examples will illustrate: The bird series which was produced by Coronet Instructional Films was made under the direction of Doctor Arthur A. Allen, Head of the Department of Ornithology of Cornell University, recognized as one of America's most eminent ornithologists; the series of Britannica Films on the United States was produced in collaboration with Doctor Howard W. Odum, University of North Carolina, well known for his work in the field of geography. The name of the individual or institution collaborating in the production of a film is indicative of its authenticity. (17, page 231)

11. Effect of a film upon personal attitudes. A film that encourages ridicule or prejudice toward the people of other races or nations, even in a slight degree, does not deserve the label of teaching film. A science film should, through its approach to the subject matter exposition, contribute toward correct scientific attitudes. (14, page 132)

12. Technical excellence of the film. A film should be smooth and steady. The central object, theme, item, or emphasis of the picture

should be plain and intelligible. Scenes dealing with certain processes or periods of development, such as the sealing of cans or the opening of flowers, should be photographed and shown in close-ups. All these scenes should reflect good composition. Actors should seem natural and carry their parts because the children of today are accustomed to seeing good acting; probably nothing will increase the students' respect for a picture more quickly than excellent acting. If animation is used, it should be sharp, clear, and to the point. (17, page 232)

13. Financial investment. Is the film a good financial investment? In answering this question, one should determine, if possible, the number of times that the film will probably be used each year. If it is of such a technical nature that it will probably be used by only one or two classes, then it should be rented not purchased. On the other hand, if the film will be used several times and in several subjects and care is taken to insure proper handling and storing, it will be more economical to buy than to rent. (14, page 131)

14. Preview the film. Whenever possible, preview the films for direct appraisal prior to a student showing. Immediately after the preview, the instructor should evaluate the film and record his opinions on a form similar to the one shown later in the study. Provisions should be made for a permanent file of this information for future reference. (25, page 236)

The evaluation has a dual purpose: (1) Evaluation assists the teacher in the effective use of the film by directing attention to the omissions and commissions. This in turn enables the teacher to provide supplementary instructional material. (2) Evaluation is a permanent record of the film and, therefore, serves as a guide for the films future use.

Part B The Need of Objectives

It is apparent that the degree of reality and experience of the learner are highly related and cannot be isolated from each other. It must be further seen that the value of various visual aids is determined in part by the objectives of instruction in the classroom. If teachers will first determine the objectives of instruction, they can then determine whether visual aids will contribute toward the attainments of this objective and which particular visual aid lends itself best toward this end.

Instructional Objectives of the Good Educational Film: Knowing the importance of objectives as a controlling factor in any teaching situation, the reviewer will find it profitable to begin by analyzing the purpose of the picture. They should ask themselves: Does the picture reveal its purposes so clearly that the purposes may easily be recognized by the intended audience? Are the purposes shown so clearly that they aid in interpreting the content of the film? As regards to scope, the objectives which the picture attempts to achieve should be broad enough to insure a rich learning experience. The objectives will be faulty, however, if they are not sufficiently limited to permit thorough treatment within the length of the film.

The objectives of a good film are adequately explained by Elliott. (11, page 582)

1. Its purposes are clear-cut and obvious to the intended audience.
2. The objectives are closely associated with those of the curriculum.
3. The objectives are those which may be adequately exploited by the medium.
4. The objectives are sufficiently limited to assure adequate treatment.

Part C Evaluating a Motion Picture

The application of standards in rating a sound motion film is necessarily a matter of judgment. The question of the relative teaching value of a specific film may involve considerable discussion, no matter how many teaching principles are applied as a check. Selection then is a task which calls for group judgment. Furthermore, it is very important that before arriving at a final rating, each reviewer should be familiar with the picture and with the unit of instruction upon which it is based. Several projections will be necessary to achieve this familiarity. Members of the advisory committee must also pass judgment upon the degree to which the picture is adapted to their local education program.

A Method for Evaluating a Film: The reviewing body will need to have a common set of standards in mind before starting to evaluate any sound films. To do this, the committee should use a check list in evaluating a motion picture. By using a check list, they can attain a high degree of knowledge about the film.

Check-List For Evaluating Educational Talking Pictures

Title of Picture_____Series_____

Number of reels_____16mm. or 35mm._____Price_____

Producer_____Distributor_____

Grade Placement_____Type of supplementary materials_____

Name of rater_____Date_____

Instructions: Study the check-list items and become familiar with the standards on which they are based. Analyze any supplementary materials,

such as, a teacher's manual which is available for the picture to be rated. Then review the picture at least twice before beginning the rating.

In using the check-list, place on each dotted line the numerical rating which you feel is most appropriate. Circle any items which obviously do not apply to the picture under consideration. After rating all items in a section, give a composite rating to the section itself. The final summary should be made when values have been assigned to all the sections.

The rating scale is as follows: 1 - "Excellent;" 2 - "Good;" 3 - "Fair;" 4 - "Poor;" 5 - "Objectionable." The scale may be extended by using plus and minus signs.

SUMMARY OF RATINGS

	1	2	3	4	5
I. Objectives					
II. Content.					
III. Development of content					
IV. Technical audio-visual elements.					
V. Overview of general effectiveness.					
General rating*.					

*In assigning a general rating, consider what you think is the relative importance of each major.

I. Objectives of the picture

	1	2	3	4	5
A. Clearness					

....1. The purpose of the picture is clear cut and recognizable by the intended audience.

....2. Objectives are so clearly evident throughout the picture that they provide the necessary perspective.

B. Validity

....1. The objectives reflect the best current practice and thought for the specific school level.

....2. Only those objectives are utilized which the medium is best qualified to treat.

C. Scope

....1. The breadth of the objectives make possible a rich learning experience.

....2. The scope of the picture aims is sufficiently limited to permit adequate treatment.

II. Content of the picture (Both visual and auditory elements)

	1	2	3	4	5
A. Appropriateness					

....1. All material used contributes to attainment of the objective.

....2. The content is adapted to modern course of study.

....3. Subject matter is free from propaganda, unless the picture frankly presents a particular viewpoint which possesses educational value.

....4. Materials are adapted to student needs as data for problem solving or as new impressions for developing appreciations.

....5. The content appeals to student interest at the particular school level.

....6. Pictorial and sound elements of the content are those which the motion picture is best qualified to present; any other types of material included are indispensable to the

continuity.

B. Accuracy of content

....1. Every element of subject matter is correct.

....2. The reproduction of visual and auditory elements in each scene is authentic.

....3. Accuracy of general impressions is insured by proper balance of elements presented.

C. Thoroughness of content

....1. Pictorial and sound subject matter include all those important ideas necessary for proper understanding.

....2. The content provides an optimum number and variety of situations involving the major concepts.

III. Development of content

	1	2	3	4	5
A. Development for unity					

....1. The introduction presents the purpose of the picture in terms the student can understand.

....2. The introduction sets up a situation challenging the students attention.

....3. The introduction is so organized that it leads quickly and naturally into the main picture.

....4. The continuity of the entire picture is such that all concepts are introduced in the order of best learning.

....5. Throughout the picture, there is smooth transition in picture and sound from each scene to the next.

....6. The treatment of the sound and visual elements is such that both contribute to the picture theme.

....7. The sound and visual elements are so handled that they give a unified presentation.

....8. In the case of an unseen speaker, integrating devices are used to suggest his presence where such an impression contributes to the reality of the scene.

....9. The picture concludes with a brief summary which recapitulates to the reality of the scene.

...10. The summary indicates or implies desirable further learning.

B. Development for understanding

....1. The length of the picture is suitable for the type and number of concepts developed.

....2. The footage for each scene and for each sequence is optimum for comprehension.

....3. Important concepts are treated in optimum detail, considering the picture objectives and the audience age-level!

....4. Vocabulary, rate of speaking, and enunciation insure understanding.

....5. All difficult concepts are illustrated, in a manner adapted to the student's past experience.

....6. Interpolated scenes represent high points of the picture.

....7. Each illustration is appropriate to the idea presented and is keyed to a proper dramatic level.

....8. There is suitable variation among the illustrations used.

C. Development for emphasis

....1. Every opportunity is capitalized to arouse and maintain interest.

....2. Distracting elements in sound and pictorial materials are avoided.

....3. Pictorial elements are dramatic in nature and presentation.

....4. Speech elements are deftly phrased.

....5. There is a proper dramatic use of sounds other than speech.

....6. Dramatic effects are shaded according to the importance of materials.

....7. There is a rhythmic ebb and flow of dramatic intensity.

....8. There is an optimum recurrence of important sound and visual elements.

....9. Repetitions are skillfully placed for emphasis.

...10. Repetitions are set in well-varied context.

...11. Attention-directing devices are used wherever an important idea might otherwise be lost.

...12. These devices accentuate the point without distracting attention.

...13. Important ideas are emphasized through proper placement with ideals of lesser importance.

...14. Important ideas underlying the development of the entire picture are presented near the beginning.

IV. Technical audio-visual elements

	1	2	3	4	5
A. Treatment of pictorial material					

....1. Objects for close study appear in sharp relief.

....2. The picture is steady (with proper projection).

....3. There isn't any eyestrain from the lighting of the picture.

....4. The lighting contributes to a pleasing artistic effect.

....5. The angles and distances from which scenes are filmed are most suitable for clear exposition.

....6. The pictorial composition of each scene is pleasing and harmonious.

B. Treatment of sound material

....1. The talking picture is free from extraneous recorded noises.

....2. The recorded volume of sound is constant.

....3. There is proper mechanical synchronization between sound and pictorial elements.

C. Cast

....1. Actors are appropriate for the characters they portray.

....2. Actors are well qualified with respect to technical ability.

....3. When the principals are expert in fields other than acting, the picture successfully reflects their personalities.

....4. The voices of all characters are clear, unaffected, pleasing, and properly dramatic.

V. Contribution to other curriculum material

:	:	:	:	:	:
: 1	: 2	: 3	: 4	: 5	:
:	:	:	:	:	:
:	:	:	:	:	:

A. Contributions to the same field.

....1. The picture gives a perspective for more thorough study of the topic.

....2. The picture illuminates a wide range of topics in the same field.

....3. The major concepts of the picture are integrated with other concepts naturally associated.

B. Contribution to related fields.

....1. Picture materials broaden the understanding of other subject-matter fields.

....2. Relationship to other fields, indicated only when desirable, are presented so as to contribute to important general concepts.

VI. Overview of general effectiveness

1	2	3	4	5

A. Educational values.

....1. The picture constitutes a comprehensively taught lesson.

....2. The selection of material and the method of presentation make the picture of intrinsic value to the learner.

....3. The picture compels the emotional and mental participation of the observer.

....4. It stimulates students to discover new implications.

B. Artistic values.

....1. The picture as a whole is an artistic presentation.

....2. The artistic effect of the picture leads to a new appreciation of the central theme.

....3. The observer is conscious of a satisfying, rich, and vivid experience. (8, page 204)

Criticisms of the Film: The motion film, "Colors Condition," is an excellent film. It is suitable for showing to senior high school students and also to college students. The objectives were very clear and were so arranged that the reviewer kept them in mind throughout the showing. The content of the film was appropriate and accurate. It also developed the understanding for the need of color conditioning in the shop. Throughout the film,

both the camera work and sound were extremely good. Because of the problem it raises and solves, the film merits the close attention of everybody interested in the film.

The check-list is one way to evaluate a film and criticism of the film is another way. Criticism is the true evaluation growing out of understanding. Reviews and criticism do not merely praise or condemn pictures; they evaluate them.

CHAPTER IV

METHODS OF SHOWING FILMS AND SLIDES FOR USE IN INDUSTRIAL ARTS CLASSES

The methods used in showing films and slides to industrial arts classes should be based on a particular purpose. Certain situations will require one method of projection while other situations will require still different projection. The slide and film strip seem to be more widely used, and they are an extremely satisfactory type of projection for industrial arts classes. Motion pictures, sound and silent, black and white and colored, are used to some extent in industrial arts classes but much less than the slides and film strips. These forms are discussed and enlarged within this chapter.

Part A Film Strips

The film strip is a comparatively new form of projection, carrying positive images. Twenty-five or more pictures or "frames" are usually found on the film. The film strip is smaller in size than most corresponding pictorial means. The film is usually wound and kept in a small metal box. These qualities and others discussed in this chapter show that the film strip is a very important aid to education as well as to the industrial arts department.

Sizes: Film strips are supplementing regular glass slides. Film strips can be purchased from a number of educational and commercial organizations at a small price or they can be rented from the state film loan libraries. The strips range from ten inches to as much as three or four feet in length. The number of pictures per strip varies from ten to more than a hundred, the usual number being between forty and fifty. Each picture on the film strip is referred to as a frame. The single frame measures three-fourths

by one inch. Recently, double-frame projectors, in which each picture on the film strip is twice the area of the single frame or one and one-half by one inch, have been produced. The projector must be specially equipped to project double frame pictures. Some projectors are also equipped to accommodate two inch by two inch slides. A special slide holder transforms the film strip projector into a slide projector.

Advantages: The film strip projector has several advantages that make it very suitable for use in the school room. The following advantages of the 35mm film strip projector as given by McKown and Roberts are: (17, page 167)

1. The projector is very light and can be moved from room to room.
2. It is inexpensive, the cost ranging from twelve to sixty dollars.
3. The films require very little space for storage.
4. The films are inexpensive, varying from three cents to six cents per frame or an average of about two dollars a roll.
5. The film strips are easily obtainable.
6. The teacher or student can easily make film strips.

Making Film Strips: Many cameras are suitable for making film strips. These cameras are usually small so they may be carried with ease, allowing the person to take the pictures desired. The cameras also have adjustments for taking pictures in varying amounts of light. The film, thirty-five mm., contains from forty to one hundred twenty frames or pictures. After the film has been exposed, the pictures may be developed by the company producing the film or by the individual. It is recommended to return the film to the manufacturer or some reliable company specializing in the development of film strips.

Cost Factors: The cost of the projectors depends upon the make, type, and model, and these prices vary from ten to five hundred dollars or more. However, it is well to keep the following points in mind, that McKown and Roberts state, when comparing prices of projectors: (17, page 172)

1. Will the projector give satisfactory results in the rooms in which it will be used the most?
2. Is the field of illumination free of bright or dull spots on the screen?
3. Can the projector be focused with ease at all times?
4. Can the parts for projecting different materials be changed with ease?
5. Is the quality of the optical system good?
6. Is it made by a reliable company?
7. Can the projector be serviced?
8. Is it easy to operate?
9. Can the tilting device be easily operated?
10. Is the projector easily disassembled for cleaning?

Part B Educational Motion Picture

In the selection of a motion picture, the chief purpose of the picture should be thoroughly understood. Its functions are the reproduction of speech, music, and other sound effects which are synchronized with the subject matter being presented. Anything less than the nearest possible approach to the reproduction of reality will be unsatisfactory from the educational point of view.

Types of Motion Picture Film: Technically speaking, there are two types of film used at the present time: the inflammable and the safety or noninflammable. The inflammable type is usually thought of as the 35mm film which is universally used in the theaters and is made of nitrate of cellulose. Reels of such film material should never be left out of their metal containers and when films are mended, all scraps should be carefully disposed of.

The safety or the noninflammable film, which most of the 16mm education films that are used in the classrooms, are made of acetate of cellulose and when exposed to intense heat, will blister and shrivel. However, if the heat is of sufficient temperature and is applied to the spot for a few seconds, the film will burn, but very slowly.

Advantages of Motion Pictures: Wherever specialized knowledge needs to be imparted to a large group, to have a vivid and lasting effect, a film may be the most effective way to present it. It may also be the best way where the subject matter is of such a character that visualization is the only or the proper way to present the knowledge realistically and accurately. Keeping this in mind, the advantages of motion picture film can be understood.

The four advantages stated by Waldron are the following: (24, page 27)

1. The illusion of reality adds conviction and depth to the learning process.
2. Many fields of knowledge cannot be adequately presented in words or in still pictures or by any method except the motion picture.
3. Many people who will not attend lectures or read books will willingly see educational films, because they are already movie-goers.
4. The film focuses group attention more effectively than do other techniques.

Cost Factors: The selection of films has been discussed in an early chapter, but the selection and cost of motion picture equipment have not been discussed. Before selecting a projector, one should know how and where it is to be used. If the projector is to be moved from room to room, a lighter weight projector should be purchased. If the projector is to be used in the classroom, auditorium, and outdoor groups, then a larger projector would be a better investment. The average cost of a classroom projector is two hundred dollars. For that reason, one should keep the points in mind, which were discussed earlier in this chapter, before purchasing a projector. In general, the projector should accommodate at least a five hundred watt bulb and if the room is not completely darkened, a larger bulb should be used. The cost of a screen also must be considered. There are many types of screens ranging from the homemade device to the expensive gold, silver, aluminum, or bead coated. The cost of these screens will

range from fifty cents to three dollars a foot.

Part C Lantern Slides

The lantern slide is used more frequently by lecturers and teachers than any other type of projected material. When a slide is projected upon the screen, it becomes a two dimension picture intended for study and observation. In observing a film, the person has to do more than look at the picture to understand it; he must interpret the meaning of the picture. The slide is used for the same purpose as other visual aids and is to supplement subject matter or make the instruction units more meaningful.

Sizes: The two by two photographic slide is possibly the most common type of a lantern slide. The increase in number of this type of a slide is due to the use of the miniature cameras, particularly in color work. The etched glass, plastic, and cellophane slide are usually three and one-fourth by four. The glass slides are possibly the most widely used slides because they are easy to make, inexpensive to rent, and can be easily colored. The glass slides give a clearer and larger image at a greater distance and will not buckle or curl under extreme heat. The cost is greater and the unavailability of suitable projectors makes this size slide very impracticable for industrial arts use. The storage problem should also be considered.

Why the Use of Still Pictures Has Increased: The use of a still picture in the classrooms of today is more extensive than ever before. There are several reasons for this unprecedented increase. McKown and Roberts discuss these reasons throughout their book. (17, page 160)

1. The extensive use of still pictures in the G. I. training.
2. There are many more companies producing still pictures.
3. Some of the leading publishers are using the still picture to supplement their textbooks.

4. The materials used in showing still pictures are relatively inexpensive.
5. The projectors used are simple to operate.
6. The projectors of still pictures, with the exception of the opaque, can be used satisfactorily in semidarkness.

Making Lantern Slides: Any of the types of slides which have been mentioned earlier in this chapter can be made by almost any person. The slides which are made by the teacher are usually of more value than the ones that can be rented or purchased. The writer feels that there should be some proof shown to support this statement: (1) The instructor can present material that cannot be presented in any other way or obtained from other sources, (2) students may use them to supplement or summarize a report, and (3) the best of the slides can be saved for permanent use. The processes used in making the different types of slides can be obtained from McKown and Roberts book Audio-Visual Aids To Instruction. Color prints are made into slides by the companies developing the film.

CHAPTER V

EDUCATION FILMS FOR USE IN INDUSTRIAL ARTS

The following list of motion pictures, film strips, and Oklahoma colleges furnishing the educational films is by no means complete. These films and their sources are constantly being added to and no one person can be aware of these constant changes. This list however, incomplete for the above reasons, is prepared to aid the industrial arts teachers in selecting motion pictures and film strips as visual aids to help in presenting an industrial arts program.

Part A Names of Oklahoma Colleges Furnishing Educational Films and Film Strip

The colleges listed in alphabetical order, with the film service regulations of each school, are given as a help for teachers or persons interested in ordering the educational films. The film loan library of the college should be written for information, if needed, before placing an order.

1. Audio-Visual Education, Extension Division, University of Oklahoma, Norman, Oklahoma.

Service Regulations

I. The films listed in this catalog are available, subject to prior request, to any school or responsible organization in the State of Oklahoma.

II. Films from this library may not be loaned to other organizations or individuals by the original borrower without permission from the Department of Audio-Visual Education of the University Extension Service.

III. How to order:
   1. State the exact title of the film desired.
   2. Indicate first, second and third choice of subjects and alternate dates of use.

3. Indicate the name and address of the individual or organization to whom the film shipment is to be sent.
4. Indicate the name and address of the individual or organization to whom a financial statement is to be sent.
5. Indicate whether shipments are to be made by express or parcel post.
6. Arrange the order chronologically by date of use of films.
7. Indicate any special instructions which will aid in filling the order.
8. Do not order sound films for a silent projector.

IV. Rentals are due and payable when the film is shipped unless other arrangements have been made in advance. Payment may be made by check or money order to the University of Oklahoma. (See unit plans on page 6.) Department of Agriculture employees and state and county extension workers have priority on the use of Motion Pictures from the United States Department of Agriculture. A service fee of $.50 is charged for each of these titles.

V. Transportation charges:
1. Borrowers are required to pay all transportation charges.
2. All express shipments are sent collect to the borrower.

VI. How to return films:
1. Return films promptly on or before the date specified in the shipping ticket. The department reserves the right to send collect telegrams or to reverse the charges on phone calls when films are not returned promptly.
2. Return teacher guides with the film.

VII. Responsibility for the film:
1. Borrowers are required to pay the cost of replacing or repairing films lost or damaged while in their possession. This usually amounts to about $0.12 per foot for black and white and $0.18 for color.
2. Do not use scotch tape to repair damaged film.
3. Do not rewind the film after the last showing.
4. Only a careful operator is an efficient operator. After threading the projector always check each sprocket and loop before starting projection.
5. Do not use rental film in learning to operate a projector. A practice film will be furnished if requested.
6. Return films promptly. This is the same courtesy others are showing to you.
7. Keep your projector clean. Consult the operator's instruction booklet to learn how to clean aperture, film channel, lenses, guides, sound head, and other operating surfaces.
8. Stop the projector at once if you notice any unusual noise or when trouble occurs.
9. Do not turn the operation of the projector over to an untrained person.

Rental Fees

The fee listed separately with each film is the minimum cost not counting postage for using that subject 1 to 5 days. Films are booked for one day unless special arrangements are made. (23, page 5)

2. Department of Audio-Visual Education, Central State College, Edmond, Oklahoma.

Rules and Regulations Pertaining to Central College Regional Film Library

1. A fee of fifty cents will be charged by regional libraries to users of state-owned films to defray service cost. The users will bear the expense of transportation of the film.

2. Forty-eight hours will be the time allowed for use of the film. This time may be extended by special permission from the Regional Film Library. (The Central Library will allow five days from time film is shipped for return.)

3. After a film has been used, it must be returned to the Regional Film Library. Repeated delinquency of user will be justification for forfeiting rights to use the films in the Regional Library.

4. Users damaging films will be required to pay the actual cost of replacement.

5. The representative from the Regional Library on the Advisory Committee shall be responsible for seeing that all reports to the State Co-ordinator are punctual and complete.

6. Film orders should be made in advance to insure prompt delivery.

7. Films are scheduled to be at your school for a certain period, and should be returned to us in time to reach our office by expiration date. If films are not returned promptly, it means that some other school's booking must be cancelled. Your co-operation is appreciated.

8. PLEASE DO NOT REWIND FILM. (5, page 2)

Rental Filmstrips

Filmstrips may be rented from the College Film Library for twenty-five cents per film a week.

Filmstrips are easily damaged and user will be responsible for damage to films.

Filmstrips may be ordered and sent out open mail and paid for on bills sent out January 1 and May 1, following use. (6)

3. Division of College Extension, Audio-Visual Center, Oklahoma A. and M. College, Stillwater, Oklahoma.

Rules for Service

1. FILM BOOKINGS

Films and other materials listed herein are available to any school or responsible organization in the State of Oklahoma.

Films are to be returned immediately after their use and are not to be loaned to anyone else without the consent of the Audio-Visual library.

Remember when you return a film late you are disappointing some other user.

In ordering, please give exact title and the date of showing. If possible give first, second, and third choice of films and the alternate dates they may be used. Book your films as far ahead as possible. A semester in advance is recommended.

2. TRANSPORTATION

Transportation charges to and from A. & M. College are paid on all materials by the user.

The user should specify the method of transportation most satisfactory for him.

A table of parcel post transportation charges is given above; also, a table of insurance charges is given.

All return shipments of films and other materials should be insured.

3. THE USER'S RESPONSIBILITY

The user's responsibility begins when he receives the films, and ends when the films are returned to the department. The user is liable for any damage to films while in his possession.

Keep your projector clean. Learn how to clean the film channel, aperture, sound head, lenses, and other operating surfaces.

After threading your projector, check carefully to see that all sprockets are properly engaged. It is unnecessary to damage film.

See that the operator remains by the projector while it is in operation and that he stops the projector immediately if any unusual noise occurs.

In threading filmstrips, be absolutely certain that the sprocket teeth are properly engaged in the filmstrips sprocket holes or the filmstrips will be ruined.

Do not project sound films on a silent projector.

Handle films only by the edges. The emulsion on the film is easily damaged.

Do not repair films with scotch tape, paper clips, or pins. If necessary to show film after being broken, repair only with a good splicer, or re-thread after the break and lap the film on the take-up reel so it will wind, otherwise return and the library will repair it.

4. ESTABLISH RESPONSIBILITY

The initial order from a school or organization should be made on letterhead stationery of the school or organization and should carry the signature and title of the person to whom shipment is to be made and to whom the materials are to be charged. Time and money can be saved by having one person in the school system responsible for the securing of all films for the school system.

5. REPACKING OF MATERIALS

Films, slides, and recordings should be repacked in the boxes in which they were received exactly as they arrived. Slides should always be tightly packed in the boxes. If the shipment is glass slides or recordings, they should be placed in the same order and packed as they were when they left the exchange. (18, page 5)

4. Film Library, East Central State College, Ada, Oklahoma.

Service Regulations

1. A fee of fifty cents will be charged for each reel of film to defray service costs. The users will bear the expense of transportation of the films.

2. Forty-eight hours will be the time allowed for use of the film. This time may be extended by special permission from the Film Library.

3. Users damaging films will be required to pay the actual cost of replacement.

4. Films from this library may not be loaned to other organizations or individuals by the original borrower without permission from the Film Library.

5. When ordering films, state the exact title and call number of the film desired and indicate the name and address of the person to whom it is to be sent.

6. Do not order sound films for a silent projector.

7. Do not use rental films in learning to operate the projector. A practice film will be furnished for that purpose if requested.

8. Rewind film after showing. Do not use scotch tape to repair damaged film.

9. Only a careful operator is an efficient operator. After threading the projector always check each sprocket and loop before starting projector.

10. Do not turn the operation over to an untrained person. (10)

5. Film Loan Library, Northeastern State College, Tahlequah, Oklahoma.

The rules for service can be obtained by writing this college.

6. Film Loan Library, Southeastern State College, Durant, Oklahoma.

Rules for Service

1. FEE

A service charge of fifty cents (50¢) per title is made for the use of all films. Each user shall make an advance deposit sufficient to care for this fee. Any unused balance will be returned at the close of the school year, or carried forward, as the user desires.

2. TRANSPORTATION

Transportation charges to and from Southeastern State College are paid on all materials by the user. The user should specify the method of transportation most satisfactory to him.

3. THE USER'S RESPONSIBILITY

The user's responsibility begins when he receives the films, and ends when the films are delivered back to the college. The user is liable for any damage to films while in his possession.

4. CHOICES OF TITLES AND DATES

When desirable, first and second choices of films should be given; also first and second choices of dates should be given.

5. PERIOD OF RENTALS

Materials will be scheduled for your use for a 48 hour period unless special arrangements are made. Films should be returned immediately after the last showing.

6. ESTABLISH RESPONSIBILITY

The initial order from a school or organization should be made on letterhead stationery of the school or organization, and

should carry the signature and title of the person to whom shipment is to be made and to whom the materials are to be charged. (20, page 1)

7. Film Loan Library, Extension Division, Southwestern Institute of Technology, Weatherford, Oklahoma.

Film Service Regulations

Shipments will be made from Weatherford by parcel post unless express is preferred. The cost of postage from Weatherford will be charged to the borrower's account; the borrower also pays the cost of postage on return shipments to Weatherford.

A postage deposit of from $3.00 to $5.00 may be sent to the Division of Extension to be used during the year.

Approximate parcel post charges are:

One reel	17¢
Two reels	19¢
Three reels	21¢
Four reels	24¢

Requests for films should be made as early as possible. It is advisable to give first, second, and third choices of dates or subjects to allow for changes in schedule which are frequently unavoidable. If a substitute would not be acceptable, it should be definitely stated. The most satisfactory plan is to prepare a semester's program in advance.

A fifty-cent service fee is charged on all state-owned films. Other films range in price from fifty cents to two dollars. State owned films are marked with an asterisk. (*) Rental and Service fees are used to defray the cost of films, repairs and maintenance.

All films will be scheduled for 48 hours unless a longer period of time is requested by the borrower, in which case an additional fee must be charged.

Users damaging films will be required to pay the actual cost of replacement. This runs from $0.12 to $0.18 per foot.

No carrier insurance is required on films listed in this catalogue.

Bicycling or loaning of films by the borrower to other individuals, or organizations will not be permitted.

DO NOT REWIND FILMS

Repeated violation of the above regulations may result in cancellation of film service. (21)

Part B A Recommended List of Films for an Industrial Arts Program

As an outcome of this study, the writer makes the following specific recommendations.

A One-Year Cycle In Showing Films: The grouping of educational films pertaining to the subject matter and skills they portray could be successfully worked out. It could be done very well by a group of teachers of industrial arts. The films that are used should be taken from as many fields and subjects in industrial arts as it is possible to secure. A group of films such as the following will be appropriate for use in industrial arts classes:

Automobile Mechanics

First Semester:

1. KNOW YOUR CAR (A-2)*
2. AUTOMOBILE CONSTRUCTION AND OPERATION (Filmstrip) (A-5)*
3. AUTOMOBILE MECHANIC (Filmstrip) (A-7)*

Second Semester:

1. TROUBLE SHOOTING YOUR CAR (A-4)*
2. LUBRICATION (A-3)*
3. ENGINE PARTS (Filmstrip) (A-8)*

Mechanical Drawing

First Semester:

1. AUXILIARY VIEWS, PART 1 and 2 (B-2, 3)*
2. SHAPE DESCRIPTION, PART 1 and 2 (B-11, 12)*
3. BEHIND THE SHOP DRAWING (B-4)*

Second Semester:

1. DRAFTSMAN (B-5)*
2. DRAWINGS AND THE SHOP (B-6)*
3. SECTIONS (B-8)*

Woodwork

First Semester:

1. HAND SAWING (C-4)*
2. STEEL RULE (C-8)*
3. WOODWORKER (C-10)*

Second Semester:

1. BASIC MACHINES - THE LATHE (C-1)*
2. FURNITURE CRAFTSMAN (C-3)*
3. ROMANCE OF MAHOGANY (C-7)*

General Shop

First Semester:

1. ELECTRICIAN (D-I, 2)*
2. HOW TO FORM ALUMINUM - GENERAL SHEET METAL PRACTICE (D-II,4)*
3. MACHINE MAKER (D-III, 2)*

Second Semester:

1. METAL CRAFT (D-II, 8)*
2. ELECTRODYNAMICS (D-I, 3)*
3. INTRODUCTION TO OXYACETYLENE (D-IV, 2)*

*Indicates source of film in list at end of this chapter.

Part C Educational Films for Industrial Arts Classes Arranged by Subjects

The listing of educational films in industrial arts subjects should save the industrial arts teacher much time and effort. The writer has given a complete description of each film. This should be a great value to the shop teacher to help him to get a clear idea of the content of the film.

The title of the film is given in capital letters. The number of reels, and in most cases the color of the film, silent or sound, and where they can be obtained with the rental price are all given in the film descriptions.

A. AUTOMOBILE MECHANICS

1. AUTOMOTIVE SERVICE 1R 11 min sd b&w (Vocational Guid.)
Photography and narration used to explain the requirements and advantages of automotive service as a prospective vocational field for boys. Development of automobiles sketched from the early models; narrator explains that increased use of autos in modern life has resulted in a greater need for men experienced in repairing and servicing them. Various specialized shop jobs shown. Oklahoma University, $1.50

2. KNOW YOUR CAR 1½ reels 15 min Sd B&W
Shows construction of a car chassis; how the engine converts gasoline into power; the function of the clutch, transmission, and rear axle; how the electrical and cooling systems function and what the telltale gages on the instrument panel indicate. Suitable for driver education and shop classes. (GM) Oklahoma A. and M. College, 50¢

3. LUBRICATION 3R 30 min sd b&w Bureau of Mines
Describes theory of friction and practical application of lubricants to the various mechanical elements connected with everyday life. Demonstrates varying degrees of friction, and illustrates useful friction. East Central State College, 50¢; Oklahoma University, 50¢

4. TROUBLE SHOOTING YOUR CAR 1R
Shows what a driver should do to locate and correct minor car troubles; how to follow an orderly and step-by-step procedure in checking why a car won't start; and how to recognize symptoms of impending trouble. (JH. SH. C.) Southeastern State College, 50¢

35mm Film Strips - Central State College

5. AUTOMOBILE CONSTRUCTION AND OPERATION
6. AUTOMOBILE IGNITION
7. AUTOMOBILE MECHANICS
8. ENGINE PARTS
9. FRONT AXLE
10. LUBRICATION AND COOLING

B. MECHANICAL DRAWING

1. ACCORDING TO PLAN: INTRODUCTION TO ENGINEERING DRAWING 1R 9 min sd b&w McGraw-Hill
Aims to help the beginning student get started on the right track in his thinking about engineering drawing. Modern production requires that many people work together on a simple project. To do so they need a common language — the language of engineering. Oklahoma University, $1.50

2. AUXILIARY VIEWS PART I (NO. 6) 1 reel Sd B&W
Shows that the three principal views do not represent the true surfaces of an object that has one or more slanting faces. This condition is

shown to require projection of the slanting surface on a plane which is prallel to it and is not one of the principal planes. Thus auxiliary projection is explained and defined, and an auxiliary elevation is constructed on the screen. Other types of single auxiliaries are only briefly discussed. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢; Oklahoma University, $2.00

3. AUXILIARY VIEWS PART II (NO. 7) 1 reel Sd B&W
Review of principles treated in Part I. Next follows a detailed description of the three types of single auxiliaries — auxiliary elevations, right and left auxiliaries, and front and rear auxiliaries. To point up this description, a number of familiar household articles are shown having slanting surfaces that require auxiliary views for complete representation. Concludes by reviewing the problem of constructing an auxiliary view, this time using the construction of a right or left auxiliary as the example. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢; Oklahoma University, $2.00

4. BEHIND THE SHOP DRAWING No. 629.13 Two Reels
This film gives some idea of the thinking and planning essential to the construction of aircraft. Details in connection with the manufacturing of planes are viewed. East Central State College, 50¢

5. DRAFTSMAN 1R 11 min sd b&w Mahnke
Presents the graphic language of lines and symbols of the draftsman in the preparation of plans for a building. Heating, plumbing, wiring, air conditioning, landscaping, machine, tool, automotive, and aviation construction, all are based on the work of a draftsman. Oklahoma University, $1.50

6. DRAWINGS AND THE SHOP 1½R 15 min sd b&w McGraw-Hill (Engineering Drawing Text Film Series No. 6)
Describes relationship between the making of the drawing and various production operation in the shop and factory; reasons for certain drafting requirements; glimpses of the organization of modern production and how to operate basic machines. Oklahoma University, $2.00

7. READING A THREE-VIEW DRAWING 1R
Shows how to use a blueprint to visualize the object; how to interpret a blueprint; and how to make a tool block according to specifications. (JH. SH.) Southeastern State College, 50¢

8. SECTIONS (NO. 4) 1 reel Sd B&W
Shows a sectional view, formed by the imaginery cutting away of part of the object to reveal interior details and make it easier to read the drawing. Explains various symbols used in sectioning. The construction of a full sectional view is demonstrated. The offset cutting plane is described, as well as other types of sectional views. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢

9. SECTIONS AND CONVENTIONS 1½R 15 min sd b&w McGraw-Hill
Sometimes important interior details of an object may show as a confused mass of dotted lines on regular exterior views. Sectional view formed by an imaginary cutting away of part of the object thereby

revealing interior details remedies this. The meaning of special sign language use in sectioning is explained. Oklahoma University, $1.50

10. SELECTION OF DIMENSIONS 2R 20 min sd b&w McGraw-Hill
The principles which govern the choice of dimensions based on two factors; (1) the functional characteristics of the object, and (2) the manufacturing methods used in making the object. Oklahoma University, $2.50

11. SHAPE DESCRIPTION PART I (NO. 2) 1 reel Sd B&W
Describes orthographic projection, utilizing animated diagrams and animated photography of specially prepared models to provide unusual three-dimensional effects. Projections of an object's surfaces are animated on three glass surfaces representing the front, side, and top views, each shown to be parallel to the surface projected on it, and perpendicular to each other. On single plane, three projected views together shown to represent fully the three-dimensional object, and provide all information necessary to construct it. — 64 — (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢

12. SHAPE DESCRIPTION PART II (NO. 3) 1 reel Sd B&W
Designed as sequel to Part I. Step-by-step procedure of constructing a drawing demonstrated, and reasons for each step explained. The film follows through on one drawing and establishes certain principles of procedure which the student can apply in making drawings of his own. Stresses the importance of clarity, accuracy, and readability in all drawings. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢

13. SHOP PROCEDURES (NO. 5) 1½ reels Sd B&W
Shows how finished drawings are used as detailed instructions in manufacturing. Drawings are seen going from the drafting room to the blueprinting machinery, from there to the workmen using blueprints at their jobs. The operation of basic machines is demonstrated . . . engine lathe, drill press, milling machine, chapter, planer, grinder. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢

14. SIZE DESCRIPTION (NO. 8) 1½ reels Sd B&W
Uniformity in dimensioning practice is essential and depends on the observation of certain standards in the use and choice of lines, figures, arrowheads, etc., and in the theory and placement of dimensions. After this has been mastered, the student must be able to choose in each case those dimensions which seem necessary to describe the article accurately, to locate the surfaces and centers for the placement of dimensions and notes. Method of describing complex drawings by breaking them down into simple geometric parts for dimensioning is shown. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢

15. THE LANGUAGE OF DRAWING (NO. 1) 1 reel Sd B&W
Attempts to provide a sensible and acceptable answer to the question, "Why Study Mechanical Drawing?" and to stimulate the beginning student's interest in the subject. Through glimpses of many jobs,

he is shown that before modern production workers can find out exactly what they are to do or give instructions to others, they must know something about Mechanical Drawing, the common language of the building world. (McH) Central State College, 50¢; Oklahoma A. and M. College, 50¢

35mm Film Strips for Mechanical Drawing - Northeastern State College

16. ANGULAR MEASUREMENT
17. CONSTRUCTIONS
18. LAYOUT TOOLS AND MEASURING INSTRUMENTS
19. LAYOUT WORK (Part I and II)
20. SCALES AND MODELS
21. T SQUARE AN TRIANGLES

C. WOODWORKING

1. BASIC MACHINES — THE LATHE 2R
Explains that the lathe is used to shape cylindrical work; shows how the workpiece is supported between centers; how power is applied to rotate the workpiece; and how the spindle speed, the position of the cutting tool, and the rate of feed may be varied to fit the job. (JH. SH. C.) Southeastern State College, 50¢

2. CABINET MAKING IN 18TH CENTURY WILLIAMSBURG 1R 10 min sd col Eastman
Begins with the Master and his eldest son as they set off to the shop, where the technique of an 18th Century handicraft — from original designs, material, tools, and methods to the finished product — is given explicit presentation. The lathe, powered by a hard-working apprentice, provides a particularly vivid sequence as it shows every significant detail, property, or utensil in use. Oklahoma University, $3.00

3. FURNITURE CRAFTSMAN 1R 11 min sd b&w EBF
Describes the roles of the designer and skilled craftsmen in making custom-built furniture. Pattern-making, laying-out, band-sawing, power-planing, joining, lathe-turning, grooving, gluing, carving, and finishing stages in close-up detail. Oklahoma University, $1.50; Northeastern State College, 50¢; Southwestern Institute of Technology, 50¢

4. HAND SAWING 2R 22 min sd b&w
In an outline of the manufacture of saws from the first made by man to the high grade steel saws of today, the difference between rip saws and cross cuts is pictured and explained, as well as their use. The set-up of the board to be sawed, the positions of the hands and body, and the movements of sawing are described for various types of work. Southwestern Institute of Technology, 50¢

5. THE IDEAL WAY 2 reels Sd Col
Contrasts woodwork and cabinet making in colonial days and present

time. Gives an over-all picture of what goes in to the cabinet making business...lumbering, milling, shaping, assembling. Cabinets of all sorts are then shown in the setting of various homes and the characteristics of each type discussed. (IDEAL) Oklahoma A. and M. College, Free

6. LUMBERING 1R
Covers the story of lumbering from forest to market. Demonstrates the widespread nature of forests; cruising; cutting; hauling logs; lumber camp; floating logs; mill and boom; cutting logs into planks; trimming and planing; drying; shipping by train and boat. (El. JH. SH.) Southeastern State College, 50¢

7. ROMANCE OF MAHOGANY, THE 2R (Silent)
This film takes the audience deep into the jungles of Central America, South America and the west coast of Africa, showing the hunt for mahogany up long sluggish rivers. There are glimpses of native life in these faraway places, and the actual felling of several trees. Southeastern State College, 50¢

8. STEEL RULE 1R 10 min sd b&w Castle
Discusses in considerable detail the steel rule, emphasizing variations of the steel rule; type of scales found on them; their proper use; correct procedures in transferring measurement by means of calipers and dividers. Oklahoma University, $1.50

9. TREES FOR TOMORROW 2 reels 20 min Sd B&W
Up to date methods of forest care and conservation; fire prevention; selective logging, replacement, forest contribution to war effort. Suitable for entertainment programs. East Central State College, 50¢; Oklahoma A. and M. College, 50¢; Oklahoma University, 50¢; Southwestern Institute of Technology, 50¢

10. WOODWORKER 1R 11 min sd b&w Vocational Guidance
Many phases of the building industry employing thousands of men who work with wood are demonstrated. Furniture, mill-work, and pattern making establishments; mill-working operations, such as sash and door, stair building, cabinet assembly; small cabinet shops; veneer and furniture factories; wood pattern-making. Oklahoma University, $1.50

D. GENERAL SHOP

I. Electricity

1. DEVELOPMENT OF COMMUNICATION 1R 10 min sd b&w
Inventions which made possible instantaneous communications — the battery, ground, connection, electromagnet, telegraph, cable, wireless, and radio — are depicted in challenging settings. Montage effects enhance historic features. Oklahoma A. and M. College, $1.50; Southwestern Institute of Technology, 50¢

2. ELECTRICIAN 1 reel 11 min. Sd. B&W
Produced by Vocational Guidance Films. Shows and describes in comprehensive, rather than detailed, fashion the work of the electrician in three major fields--power and lighting, communication, and transportation. Many special jobs are shown and described, including work of the top-ranking graduate electrical engineer. Suggested sources of training are described while the interior of a trade school with students "learning by doing" is shown. (C. F.M.) Oklahoma A. and M. College, $1.50

3. ELECTRODYNAMICS 1 reel 11 min. Sd. B&W
Direct photography demonstrates cause and effect, while animation explains the fundamental principles of current electricity and electromagnetism. Among the concepts presented are: Galvani's discovery and current electricity; magnetic field about a current carrying wire; magnetic field of coil; electromagnets. Central State College, 50¢; East Central State College, 50¢; Oklahoma A. and M. College, 50¢; Oklahoma University, $1.50; Southeastern State College, 50¢

4. ELECTRONS 1r
The hypothesis is that electricity consists of unit elementary charges is supported by observation of phenomena associated with the conduction of electricity in liquids, gases, and vacuum. Central State College, 50¢; East Central State College, 50¢; Oklahoma A. and M. College, 50¢; Oklahoma University, $1.50; Southeastern State College, 50¢

5. ELECTROSTATICS 1 reel 11 min. Sd. B&W
Explains how positive and negative electrification are produced. Animated drawings show the part played by insulators and conductors. Natural photography supplemented by animation gives a remarkable exposition of the movement of charges in the electroscope, the Compton electrometer, the static machine, and Nature's display of static electricity--lightning. The history of lightning arresters is depicted with reference to building protection. Film content correlates with physics, electricity, radio, general science, meteorology, and industrial arts courses. (EBF) East Central State College, 50¢; Oklahoma A. and M. College, 50¢

6. ELEMENTS OF ELECTRICAL CIRCUITS 1R 11 min. sd b&w EBF
Nature of electric currents and circuits. Electron motions, conductors, insulators, and factors affecting resistance are a few of the subjects explained. Oklahoma University, $1.50

7. FLOW OF ELECTRICITY 1R 10 min. sd b&w EBF
Demonstrates the factors that affect the flow of electricity in a simple circuit and the application of such a circuit in the home. Oklahoma University, 50¢; Southeastern State College, 50¢

8. HOME ELECTRICAL APPLIANCES 1R 11 min sd b&w EBF
Animated drawings illustrate common heating and motor appliances in the home. Scientific principles of thermostatic controls, flouresecent lighting, and electric refrigeration. Oklahoma University, 50¢

9. MAKING ELECTRICITY 1R 10 min sd b&w
Provides a fascinating demonstration of how electricity is made by moving a coil of wire through the field of a magnet. Explains first how a small, hand powered generator is constructed and how it operates; then illustrates how the same principle applies in generating electricity at a large hydro-electric plant. Reveals finally how electricity is carried over power lines to the consumer. Southwestern Institute of Technology, 50¢

10. PRIMARY CELL No. 621.35 One Reel
Explains the operation of the dry cell in terms of electron action. Detailed action is shown at the zinc electrode and at the carbon electrode including depolorization. Cells are shown working as batteries in both series and parallel connections. East Central State College, 50¢

11. PRINCIPLES OF ELECTRICITY 1R 20 min sd b&w
Explanation of atomic union, positive and negative charges, electronic balance in atoms, voltage, amperes, resistance, and magnetism is given. Also, the principles of generators and electric motors are given. Southwestern Institute of Technology, 50¢

12. SERIES AND PARALLEL CIRCUITS 1R 10 min. sd b&w EBF
Relationship between resistance, current, and voltage in series circuits and then in parallel circuits. Practical advantages and disadvantages of each circuit illustrated. A simple series-parallel combination described and explained. Oklahoma University, $1.50

13. WORLD'S LARGEST ELECTRICAL WORKSHOP 2½R 30 min sd b&w
An intimate glimpse into America's largest electrical workshop. Internationally known Drs. Langmuir, Whitney, and Coolidge are shown in their laboratories. Equipment ranging from giant turbines to small domestic devices are shown in progress of construction. Southwestern Institute of Technology, 50¢

II. General Metal Work

1. ALUMINUM: FABRICATING PROCESSES No. 669.7 Two Reels
Working, shaping and casting into forms and plates, from which commercial articles are produced. East Central State College, 50¢; Oklahoma University, 50¢; Southeastern State College, 50¢

2. HOW TO FORM ALUMINUM — BLANKING AND PIERCING 1½R 16 min sd b&w
U. S. Bureau of Mines
Techniques of blanking and piercing illustrated by animated drawings; the tools enployed and the material used in blanking, followed by the operation of die and punch. Closes with a summary of instructions on design, lubrication, and maintenance of tools. Oklahoma University, 50¢

3. HOW TO FORM ALUMINUM — DRAWING, STRETCHING AND STAMPING 2R 22 min sd b&w U. S. Bureau of Mines
Techniques of sheet-metal working illustrated by animated drawing,

opening with reference to properties of cold-working and heat-treatable aluminum alloys and purpose of heat-treating and refrigerating metals, and closing with a summary of operation and instruction on selection of metal and use of tools. Oklahoma University, 50¢

4. HOW TO FORM ALUMINUM — GENERAL SHEET METAL PRACTICE 2R 21 min. sd b&w U. S. Bureau of Mines
Techniques of sheet metal working illustrated by animated drawings. Closes with summary of fundamentals of operation. Oklahoma University, 50¢

5. HOW TO FORM ALUMINUM — SPINNING 1½R 17 min sd b&w U. S. Bureau of Mines
Techniques of metal spinning shown by animated drawings. Standard tools required, individual charactertistics of tools developed by metal spinners. Lubrication and fundamentals of metal spinning. Oklahoma University, 50¢

6. HOW TO FORM ALUMINUM — TUBE AND SHAPE BENDING 1½R 14 min. sd b&w U. S. Bureau of Mines
Techniques of bending illustrated by animated drawings. Problems in tube bending and factors involved, such as: thickness, size, and shape of tubes. Concludes with a recapitulation of instruction and machine bending, and importance of smooth finish on contact surfaces of bending tools. Oklahoma University, 50¢

7. IRON AND STEEL 1 Reel
Operation of an open-pit mine in northern Minnesota; transportation of ore to the mills: operation of a blast furnace and smelter; Bessemer converter and opern-hearth furnace; production of sheet, rail and bar steel. (JH. SH.) Southeastern State College, 50¢

8. METAL CRAFT 1R 12 min. sd b&w
Explains the steps taken by a master craftsmen in making a pewter bowl, a bronze bowl, and a molded candlestick. The designing, chasing, shaping, and soldering the sides and top of a jewel box also are shown. Central State College, 50¢; Northeastern State College, 50¢; Southwestern Institute of Technology, 50¢

9. SHEET METALWORK 1R 10 min sd b&w Kahnke
Sheet-metal work performed by hand and by machinery. A knowledge of arithmetic and of angles necessary. The government requires its sheet metal workers to have a high school education or its equivalent. Jobs in this field are: furnace manufacturing and repairing, operation of sheet-metal brake, metal roof, gutter skylight and ventilating installations, air conditioning and others. Oklahoma University, $1.50

10. THIS IS ALUMINUM 669.7 T34 Three Reels
Illustrates the steps necessary in the mining, transporting, processing, storage, grinding, and crushing of aluminum. East Central State College, 50¢; Oklahoma University, 75¢; Southeastern State College, 50¢

11. STORY OF NICKEL 3R 30 min sd b&w Rothacker
A revised version of earlier "Nickel Highlights." A condensed summary

of the three nickel subjects; the management of this world-wide organization has welded these immense plants into one single operation. East Central State College, 50¢; Oklahoma University, 50¢; Southeastern State College, 50¢

12. TINPLATE 3 reel
"Tinplate" is a sound film in color portraying the manufacture of tinplate, basic material of the two million tin cans that Americans use every day. The film depicts, step by step, the making of tinplate from the raw materials to the finished product. (Jr. H., Sr. H., Col.) Southeastern State College, 50¢

III. Machine Shop

1. DRILLING, BORING, REAMING 1R 10 min sd b&w Castle
Presents in considerable detail the centering of a gear blank in an independent chuck, the selection and setting of the tool for facing the gear blank; drilling, boring, and reaming with the tail center; and reviews the use of the taper attachment in the making of a taper bore. Oklahoma University, $1.50

2. MACHINE MAKER 1R 10 min. sd b&w EBF
The setting and personnel of a machine tool factory. Demonstrates the operation and manufacture of lathes, millers, planers, drill presses, boring mills, grinders, and other machines. Reproduces workers' conversations on technical problems. East Central State College, 50¢; Oklahoma University, $1.50

3. MILLING MACHINE 1R 8 min. sd b&w Castle
Demonstration of a plane milling machine: basic parts, various control levers, action of the table longitudinally, vertically, and cross-wise. Oklahoma University, $1.50

4. THE MICROMETER 2R 12 min. sd b&w Castle
Detailed explanation of the basic principles on which the micrometer works, correct care, use and maintenance of a micrometer; and the various forms of the micrometer developed to measure outside lengths, inside lengths and depths. Oklahoma University, $2.50

5. TURNING WORK OF TWO DIAMETERS 2R 14 min. sd b&w Castle
Emphasizes the care and operation of the machine: necessity for advance planning of the work, setup for the job, checking with blueprinting, laying off and nicking the piece for machining rough and finish turning to close tolerances, rough and finished facing, and rough and finished turning of fillets. Oklahoma University, $2.50

IV. Welding

1. A STORY OF ARCH WELDING 2½ Reels
The film opens with a dialogue revealing that arc welding was orginally

used mainly for repairing military equipment. Then an industrial official demonstrates to the shop foreman, by comparative strength tests of steel and cast iron, the advantages of employing arc welding in the fabrication of rolled steel to replace cast iron, and the use of welded joints in structural steel shapes to replace rivited joints. There follow detailed instructions in the techniques of arc welding — the selection and use of the electrode, adjustment of the welding machine providing the current, the safety clothing of the welder, and the method of striking the arc. Southeastern State College, 50¢

2. INTRODUCTION TO OXYACETYLENE 2R 22 min. sd b&w
The welder's tools and equipment are introduced by means of a series of pictures designed to show the importance of the welder's job. The correct method of getting a flame is shown and explained, as are the three types of flames which can be obtained. The picture closes with instructions on how to finish the job and put away the welding equipment. Southwestern Institute of Technology, 50¢

3. OXIDATION AND REDUCTION 1R 12 min. sd b&w
Develops the oxygen theory of combustion. The removal of oxygen from compounds is illustrated by an animated portrayal of the operation of a blast furnace; by the reduction of dry ice to carbon by magnesium; and by the thermite welding process. East Central State College, 50¢; Oklahoma University, $1.50; Southwestern Institute of Technology, $1.50

4. OXY-ACETYLENE WELDING 2R 20 min. sd b&w Jam Handy
Importance of a welder's job; introduces the welder's tools, equipment, and correct method to get a flame. Oklahoma University, $2.50

5. OXY-ACETYLENE WELDING IN INDUSTRIAL PRODUCTS 2R 20 min. si b&w
Linde Air Products Co.
Actual scenes where oxy-acetylene welding is being employed in manufacturing; its speed and economy. Oklahoma University, $1.50

6. OXY-ACETYLENE WELDING IN PRODUCTION No. 671 Two Reels
Production of automobile bodies, refrigeration units, welding of aluminum fuel tanks. Second part shows welding of pressure vessels and transformer tops. East Central State College, 50¢

35mm Film Strips - Central State College

7. WELDING

Concluding Statements: The writer, in completing this study, has had to stop because the problem is one that is continuous. Newer and better ways of validating films will be one of the recurring problems to be solved. There are many processes and skills used in industry and industrial arts that will be filmed. All of this information and where to obtain films

in Oklahoma will present problems that will need someone to solve or to study.

It is the writer's hope that someone in industrial arts education will continue the study as to the securing of more and better ways of using projected pictures in industrial arts.

A SELECTED BIBLIOGRAPHY

1. Bennett, Charles A., History of Manual and Industrial Education 1870 to 1917, The Manual Arts Press, 1937, 566 pages.

2. Barefoot, Olen Guy, Audio-Visual Aids in Public Schools, Thesis, Oklahoma A. and M. College, 1939, 77 pages.

3. Beckham, Wicks G., The Use of Opaque-Pictures in Visual Education, Thesis, Oklahoma A. and M. College, 1940, 104 pages.

4. Bonser, Fredrick G. and Mossman, Louis C., Industrial Arts for Elementary Schools, The Macmillan Company, New York, 1931, 483 pages.

5. Central State College, Film Catalogue and Inservice Study for Showing Audio-Visual Aids, Central State College, Edmond, Oklahoma, 1949, 16 pages.

6. Central State College, Film Library 35 mm Film Strip, Central State College, Edmond, Oklahoma, 1949, 14 pages.

7. Charters, W. W., Motion Pictures and Youth, The Macmillan Company, New York, 1933, 102 pages.

8. Devereux, Fredrick L., The Educational Talking Picture, The University of Chicago Press, Chicago, Illinois, 1933, 222 pages.

9. Dorris, Anna V., Visual Instruction in the Public Schools, Ginn and Company, New York, 1928, 481 pages.

10. East Central State College, 16 mm Sound Film Catalogue, East Central State College, Ada, Oklahoma, 1949, 41 pages.

11. Elliott, Godfrey M., Film and Education, Philosophical Library, New York, 1948, 597 pages.

12. Fulton, W. R., Problems in Administration of Projected Visual Aids Based on Industrial Data, Thesis, Oklahoma A. and M. College, 1939, 61 pages.

13. Graduate Students, Oklahoma A. and M. College, Problems in Sheet Metal Work, Oklahoma A. and M. College, Bookstore, Stillwater, Oklahoma, 1941, 55 pages.

14. Hoban, Charles F., Visualizing the Curriculum, Gordon Company, New York, 1937, 300 pages.

15. McClusky, Doctor T. Dean, "Problems in Using Visual Aids," The Instructor, 48: 71-74, February, 1939.

16. McDannald, Encyclopedia Americana Volume 22, Americana Corporation, New York, 1946, 800 pages.

17. McKown, Harry C. and Roberts, Alvin B., Audio-Visual Aids to Instructors, McGraw-Hill Book Company, Inc., New York, 1949, 608 pages.

18. Oklahoma A. and M. College, Audio-Visual Aids, Division of College Extension, Audio-Visual Center, Stillwater, Oklahoma, 1949, 111 pages.

19. Roberts, A. B., "An Introduction to Visual Aids," School Activities, 10: 212-214, January, 1939.

20. Southeastern State College, Visual Education Catalogue, Southeastern State College, Durant, Oklahoma, 1948, 36 pages.

21. Southwestern Institute of Technology, Educational Film Catalogue, Extension Division, Southwestern Institute of Technology, Weatherford, Oklahoma, 1949, 28 pages.

22. State Advisory Committee for Industrial Arts in Oklahoma Schools, A Course of Study in Hand Woodworking 1a and 1b, State Department of Education, Oklahoma City, 60 pages.

23. University of Oklahoma, Audio-Visual Education, University of Oklahoma, Norman, Oklahoma, 1949.

24. Waldron, Gloria, The Information Film, Columbia University Press, New York, 1949, 281 pages.

25. Weaver, Gilbert G., Visual-Aids, Their Construction and Use, D. Van Nostrand Company, Inc., New York, 1949, 388 pages.

26. Wilber, Gordon O., Industrial Arts in General Education, International Textbook Company, Scranton, Pennsylvania, 1948, 362 pages.

Typist: Mrs. Beth Wallace