ANALYSIS OF THE PERIODICAL LITERATURE
IN OKLAHOMA A. AND M. COLLEGE LIBRARY
WITH REFERENCE TO
THE PEDAGOGY OF VISUAL EDUCATION

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THE PEDAGOGY OF VISUAL EDUCATION

By

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J. V. J.

Oklahoma A. and M. College,
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CHAPTER I

INTRODUCTION

The writer of this thesis has for several years, while employed as a teacher, used many of the various aids in his teaching processes. The unusually favorable results secured with the addition of visual aid instruction to the regular teaching process led the writer to become further interested in the field of visual education. As a result of this interest and experience in the subject, he designed this thesis to bring together related material from periodical literature bearing upon several phases of visual education. While necessarily incomplete on account of the magnitude of the study, the thesis presents as a group many valuable possibilities and problems in visual education, together with the attitudes of modern educators on these possibilities and problems.

During the past quarter of a century, educational understandings and techniques have made amazing progress. Step by step the school, both in its daily routine and its objectives, has become more like life. In order to keep step with this progress, it has become necessary to use these new modern developments now available to the visual aid program.

A remarkable change has been appearing and is now developing in our public school programs. This is a very progressive movement which is rapidly casting aside many of the old whims, notions, and prejudices concerning educational methods. Much of this has, no doubt, been brought about by the slow introduction of visual aid and other devices that have been contributing so much to the inter-

ests and usefulness of the subject matter taught. During the past
few depression years, when a great number of schools found it neces-
sary to cut their terms short of the regular length, remarkable
progress has been made along the study of 'visual aids' in teaching.

In making a concise study of the periodical literature used in
writing this thesis, no attempt has been made to present all pos-
sible phases of the subject. This study emphasizes factual data
collected from the periodical literature now available in the Okla-
homa A. And M. College Library. Since it appears that an attempt
to unify the data contained herein would reduce the value of this
thesis, which is in the worth of an analysis of the periodical lit-
erature with reference to the pedagogy of pictures in visual educ-
ation, it becomes a difficult undertaking to evaluate the data from
various sources. Without doubt, years of research and experimen-
tation would be needed to make an exhaustive study of visual edu-
cation.

A sufficient number of articles has been annotated to indicate
the trend in periodical literature. Some have not been annotated
because they are to some extent duplications of the other articles.
However, these titles and references have been included under the
heading, "Additional Articles".

VISUAL INSTRUCTION OF TODAY

Visual instruction has come to be recognized as any type of
instruction supplemented and enriched by various types of aids
which contribute through the seeing experience to the general under-

standing of the subject matter of pictures. In our periodical lit-
erature much has been written recently on the subject of "Visual
Education" and that of "Visual aids in Education", as well as many
other related subjects. Some of these writers contend that there is
one best title and only one which should be used while others use
them interchangeably. In the light of what has been written at
present it would appear that the better term would be "Visual In-
struction Aids" since the word "education" connotes rather the
learning process, while "instruction aids" better indicates learning
procedure. Quoting from Elsworth C. Dent, "Visual education is
nothing but education in which visual experiences play the princi-
pal role. It means the modification of human personality through
the medium of directed visual observation, as is exemplified in the
conception of 'light', 'color', or 'space'."[1] The term visual ed-
ucation seems to be rather unscientific as education is rarely con-
fined to one sense but in most instances is multi-sensory. There-
fore, the writer will confine himself to the pedagogy of pictures
in visual education since this appellation implies a position of
helpfulness in achieving a desired objective. Furthermore, correct
visualization is possible only through comparison of past experi-
ences. The power to appreciate and enjoy depends on the richness
of an individual's experiences in life. A child's world is small;
he knows little outside of his own home environment. His experi-
ences, therefore, are limited; so he is sent to school to be led
into a richer and more abundant life. But in the school the child
is called upon to read about far-distant lands and to mingle with

strange, unknown beings, the life of which he has never seen. It is all outside the realm of his childish experiences. He has, as yet, but little concrete association with many of the ideas about which he is reading; therefore, the words are merely empty symbols.[2] We hardly have to seek our education now. It comes to us. Mechanical inventions of the Twentieth Century not only bring us learning, but bring it in a way that we can easily digest, even to the youngest boy or girl of our present schools. This must be so for a generation in which people literally run while they read. That explains why we must make use of these means of visual aids to improve our minds, as well as to entertain us. In a history class, for instance, Johnny lives in a historical yesterday, made so vivid by pictures that he can't forget it. This is the real reason for the educational success of motion pictures.[3]

HISTORY OF VISUAL AIDS AND THEIR ADAPTABILITY
TO OUR EDUCATIONAL SCHOOL SYSTEMS

The first communicated messages were gestures or signs made by various movements of the hands. Next came speeches; but neither of these methods of conversing with one another could be recorded. The desire to overcome time and space moved primitive man

1 Elsworth C. Dent, A Handbook of Visual Instruction, 1934, p. 1.

2 Anna Veronica Dorris, Visual Instruction in the Public Schools, 1928, p. 28.

3 J. H. McNabb, Visual Education (Educational Screen), May, 1929, p. 156.

to draw pictures. At first, these were mere sketches in the sand and stone, and thus were pictures born. This unusually crude form of conversing by means of pictures changes to alphabetical symbols. No longer did man make real pictures but he made word images instead. These printed word images were only charts and contained very little detail; this was left to the reader to supply from his own experiences. School authorities have unconsciously recognized this deficiency by ever increasing the number of illustrations on the printed page, each of these illustrations being an acknowledgment of the limitations of word images.[4]

The use of visual instruction may be traced back through the educational history of the human race. In primitive times boys were taught to hunt and fish and girls to cook through imitation, observation, and participation, plus the necessary language explanation. Early records were picture records. The Greeks utilized the school journey, the sand blackboard, and real objects of life in their instructional processes. Forerunners of modern education used visual instruction. Such noted pioneers as Comenius, Rousseau and Pestalozzi emphasized it.

In our study we find many adoptable factors contributing to our educational system:

(a) The invention of the photograph and of photoengraving have made possible the illustration of magazines, newspapers, books, and school textbooks on a scale heretofore impossible.

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4 M. M. Brine, Visual Education in the Kindergarten (Educational Screen), February, 1936 (XV), p. 54.

(b) The motion picture, with or without sound, has become a major factor in modern life for the dissemination of information, knowledge and ideas.

(c) Stereographs and stereoscopes have brought the illusion of three-dimensional pictures to the classroom.

(d) Visual aids are most effective when closely correlated with the course of study or curriculum.

(e) The organization and administration of visual materials must be such that they are available at the precise moment when they are needed.

(f) A few pertinent illustrations are better than a score of more or less related ones. For example, intensive study of a few excellent slides and stereographs is, in most instances, better than a succession of somewhat related pictures.

(g) Visual aids should make accessible to the classroom that which is inaccessible. Visual aids are valuable also in re-creating in the classroom familiar subject matter.

(h) The stereograph has been found to be valuable as an individual study experience.

(i) The stereopticon slide forms an excellent basis for the socialized recitation.

(j) The motion picture is an effective story teller.[5]

THE EFFICIENCY OF THE PICTURE IN INSTRUCTION

It has been estimated that about eighty percent of our learn-

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5 Elsworth C. Dent, A Handbook of Visual Instruction, pp. 11-12.

ing comes through the eye. Such being the case, it is needless to discuss further the value of visual aids in our school systems to-day.[6] It is regrettable fact that public instruction leaders have been slow in recognizing the effectiveness of visual instruction. The appalling strength of the motion picture in the formation of habits has been recognized for years but only in recent years have the educators realized a plan for "carrying over" this material into the schools.[7]

What are the schools doing to-day to reap this harvest of visual instruction? A complete discussion of this question could cover several volumes; but parents need only to compare the materials in books they used and the books that are being used to-day by their children to note a striking improvement and a splendid example. The books of twenty years ago contained but very few pictures, mostly ill-chosen. The books of to-day contain many logically arranged pictures. A pupil of to-day can see the picture of that which he is reading about. That is certainly of paramount importance. One parent was heard to remark that he had studied about oranges, yet had never seen this fruit as it grows. Another had studied about methods of gold mining, but had no conception of a gold mine because of the lack of pictorial material. One can supply hundreds of other similar examples of this lack which is remedied by modern visual aids.

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6 M. R. Ahrens, Visual Instruction (The Visual Talkie), February, 1932, IV, p. 3.

7 Cline M. Koon, Motion Pictures in Education in the United States, June, 1934, p. 2.

If a wide awake school will stop to consider only a few of the things which the intelligent use of visual aids may accomplish, that school may not decide so quickly that, just because visual instruction was one of the last activities to be added, it should be one of the first affected by strict economy.

All the experimental evidence of any importance shows that the proper use of visual aids will (1) increase the amount of useful knowledge gained during any stated period, and (2) make it possible to shorten the time generally required for the teaching of any of several subjects or groups of subjects. It would seem, therefore, that true economy could best be effected by increasing expenditures for visual aid items. This is of greater importance when one considers that visual aids help the poor student more than they help the exceptionally good one. The bright child will ferret out information in spite of poor teaching methods. The dull student must be stimulated by something other than the rod or he will fall into that one costly group known as "repeaters". To reduce the number of repeaters in any system would certainly prove to be economical, especially when it might be accomplished at very little cost per pupil.[8]

Schools all over the nation are procuring equipment and instituting visual aid libraries just as they once began a book library. Many larger schools have even employed educators as directors, teachers and supervisors of visual education whose sole duties are

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8 Ellsworth C. Dent, The Audio-Visual Handbook, 1937, p. 4.

to administer to the needs of teachers and pupils. Many school boards are beginning to include in their budgets a sum to be devoted to the building up of a visual aid library.[9]

PHOTOGRAPHY

Since photography is essentially a process of "harnessing light to make pictures", these pictures that intensify the quality of light give us the most vivid feeling of reality that the photograph in its various manifestations can give. It is for this reason that the projection, whether in motion picture or in slide, in black and white or color, gives us more of the plastic quality resembling the original object than can the corresponding print.

There is no visual recording tool more expressive of our world to-day than the camera.[10] It registers actions that will never be duplicated, fixes patterns that will never occur again. With the microscope it penetrates the inner activity of materials; with the telescope and by aerial photography it charts huge surfaces and vast regions; by telephoto and with the infra-red ray it annihilates and dissolves distance. It is the mirror for our concrete experiences.

There are two approaches in the use of the photograph, each sharing in the power to make instruction more effective, interest-

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9   Frederick L. Devereaux, The Educational Talking Picture. July, 1933, p. 125.

10   Charles F. Hoban, Charles F. Hoban jr., and Professor S. B. Zisman, Visualizing the Curriculum, 1937, p. 175.

ing and profitable. The first of these approaches consists of direct experiences, entailing the actual making of the photograph by teacher and pupil. It includes first hand experience in observing, making the picture, and finally fixing the record. The second approach is through vicarious experiences obtained by purposeful accumulation and use of the observations and visual recordings of others, which reveal the expanding horizon of new concepts, develop the power of interpretation, simulate travel to distant lands, creates extra-personal attitudes, and penetrates the mysteries of the body and the structures of nature. These approaches require planning and careful consideration of their relation to the lesson or instruction problem. A well-chosen picture may stimulate a whole series of spontaneous discussions and compositions or develop an equally valuable series of preparations.[11]

Camera work by the teacher carries the use of the photograph into an extremely important function. Those teachers who travel, as all should, can record their experiences of places, people and things to serve as material aids in the classroom. One high school teacher in Boston has in this way built up an enormous collection of excellent prints, slides, and movies in a great variety of subjects which he himself and others use and which also serve as the basis of lectures to fellow-teachers.[12]

No school is able to purchase all the material it would like to use; and many schools are able to purchase little or none. The

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11 Ellsworth C. Dent, The Leica in Visual Education (The Leica Manual), 1936, p. 276.

12 Ellis C. Persing, The Use of Contact Prints, 1936, p. 10 and 12.

use of the camera by teacher and pupil complements or fills a car-
dinal need in the classroom. Methods of obtaining pictures vary
with the sources. Newspapers and magazines, the latter often ob-
tainable at little cost from second-hand dealers, are immediately
available. The quality of these may almost be taken for granted to-
day. Good technique in photography is common.

Photographs obtained at expositions and fairs offer excellent
material for teachers to gather background information and pictures
for the classroom. The exhibits at such places are usually arran-
ged to tell a story, and therefore enable one to get a series of
pictures, which might otherwise require much time and travel.

The function of the photograph as a record that can be viewed
for extended study indicates its wide application. Almost all
forms of visualization can be translated to some extent in terms
of a flat picture, through the isolation of a detail of the motion
picture, for example, or through a direct copy of other two dimen-
sional forms such as graphic material. In making, selecting, and
using pictures, certain standards of quality and guides for intel-
ligent and efficient application should be followed. The purposes
for which the picture is used should constantly be kept in mind.

THE MOTION PICTURE

The motion picture, especially the talking motion picture, is
the king of all visual aids. Despite the popularity of this
statement, the motion picture is not always preferable to other
visual aids, and, even though a school has unlimited funds, a

wise teacher would not always use motion pictures exclusively.

Motion pictures have many very definite uses and they are
valuable when applied specifically with those aims in view.
(1) The moving picture has the unique advantage of depicting ac-
tion of behavior, with its irresistible illusion of life and re-
ality. It is, however, an expensive visual aid and for that reas-
on should be resorted to only when necessary, (a) to show activity,
which no other pictorial aid can actually portray, and (b) to pro-
vide such various experiences as may be brought to us because we
cannot get them in any other way. (2) The Motion film has proved
valuable to scientific workers by enabling them to reproduce pro-
cesses and analyze motions and movements for detailed study. (3)
the motion picture film aids in presenting popular non-technical
phases of a subject to those who have relatively little knowledge
regarding it. (4) The motion picture is very effective in pub-
licity, drives, campaigns for social betterment and similar forms
of propaganda. (5) The film is unique in revealing, for the
first time in the history of human learning, things which are too
slow or too fast to be seen by the human eye.[13]

The choices involved in the purchase of motion picture projec-
tors are these: 16 millimeter or 35 millimeter; silent or sound.

Of the factors influencing choice, first of all is the amount
of money available. The smallest possible expenditure for a si-
lent 16 mm. projector is from $50 to $150. If no more money than
this is available, it is clear than one cannot choose a sound 16

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13 Ellsworth C. Dent, op. cit.,p. 738.

mm. projector costing from $350 to $750. There remains the possibility of a later purchase of sound equipment. One can purchase a silent projector which is convertible into a sound projector by the addition of a "sound head", thus allowing for a change should one first decide to buy only a silent projector. Some directors of visual instruction doubt the wisdom of this procedure, since it would mean the later addition of a new "sound head" to a worn projector. Some companies meet the situation by offering a definite trade-in allowance for silent projectors when they are turned in on the purchase of a sound projector.[14]

One should bear in mind that either sound or silent films can be shown with a sound projector. Sound films are so made, however, that they cannot be used on a silent projector.

Few schools would now think of buying a 35 mm. silent projector. Educational film libraries are confining their purchases largely to the 16 mm. size. Educational films will be increasingly difficult to secure in the 35 mm. width. Films are also more expensive to secure for the large type machines. Transportation charges are much higher, since a reel of the wide film with shipping case, weighs almost three times as much as the equivalent material in 16 mm. stock.

It should be pointed out, too, that typical theatrical films are printed on nitrate base stock, which is highly inflammable. Some of the 35 mm., of course, are printed on the acetate base, which is slow burning. All 16 mm. film is of the slow-burning

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14 Edgar Dale and Lloyd L. Ramseyer, Teaching With Motion Pictures, April, 1937, p. 9.

acetate type, whether it is an entertainment film or an educational film.

The writer knows of no school that has purchased a 35 mm. portable sound projector to be used only in classroom work. A number of schools have equipped their auditoriums with 35 mm. sound projectors and use them to show educational and entertainment films. They do encounter difficulties, however, in securing entertainment films from the exchanges, due to the opposition of exhibitors. Schools contemplating the purchase of this kind of equipment must bear in mind the likelihood of such opposition. The same opposition, but perhaps not so intense, occurs with the use of the 16 mm. equipment when it is used for noon-hour or entertainment purposes.

The difficulty occurs in part because school people have not sufficiently clarified what they expect to get from their use of films. Obviously, merely to duplicate what the commercial theater does is not educationally justifiable. The only kind of motion picture program which can be logically justified is one which makes a distinct contribution to the objectives of the school. This will eventually mean, in the writer's judgment, the development of a kind of film which is educational, realistic, and interesting to view but which will not merely copy and accept the entertainment pattern of the motion picture theater.[15]

THE GLASS SLIDE

There are two dominant values generally recognized in pictor-

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15 Ibid., p. 10.

ial material. These are that in certain situations, pictures tell a story more vividly and tersely than words; and that the story or situation can be grasped from a picture in a much shorter period of time. These statements may be verified through the use of pictures representing a century of dress.

The glass slide serves to present visually to a class or audience-group material which is intended to preview, clarify, or supplement subject matter or to make instruction on curriculum units more meaningful. An essential requirement for the effective use of slides in instruction is that the slides, whether purchased or made for the school units, be of the highest quality. They should conform to certain standards both in their manufacture and in the content of their material.

There are two kinds of glass slides now in general use in schools. PHOTOGRAPHIC SLIDES: These are made from original negatives of scenes and situations connected with curriculum subjects—art, geography, literature, history, science, etc.,—— and reproductions of photographs, prints, posters, charts, maps, and the printed page. These slides are made by commercial concerns which have a staff of experts. PUPIL-TEACHER MADE SLIDES: Many teachers and clever pupils can make worthwhile slides. The ordinary glass slide is $3\frac{1}{2}$ x 4 inches in size, and fits all the common slide projectors. It is usually composed of four or five parts; (1) the slide plate, or glass on which the picture has been printed, (2) a mat, to keep the dimensions of the picture within the size of the aperture gate of the projector, (3) a cover glass, to

protect the emulsion or picture on the slide plate, and (4) the binding tape, which is used to fasten the plate and cover glass together firmly and prevent dust or moisture from getting between the two and damaging the picture. The fifth part may be a piece of cellophane, a silhouette picture, or a photographic positive, on which a picture or outline has been drawn or printed for projection.[16]

Slides should be organized and arranged according to subjects and units. Teachers of geography, history, and other subjects should be expected to find slide material for their units of study systematically arranged in a drawer of the slide cabinet, properly labeled and easy of access. To provide this service, it is necessary to provide a proper filing cabinet. A slide collection will not take care of itself. It is a valuable instructional asset and should be kept in the same condition as dishes and cutlery in the home.

The glass slide has become one of the most useful visual aids and is being adapted to new purposes from year to year. No other type of projected visual aid can equal it in quality of the projected image or in adaptability to a wide range of uses.

THE STEREOPTICON AND LANTERN SLIDE

The teacher who has visited the national parks, who has seen the Grand Canyon National Park; who has motored to the Gulf of

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16 Ellsworth C. Dent, op. cit., p. 49.

Mexico, or who has experienced the thrill of looking out over New York City from the top of one of its skyscrapers, is the much more competent to tell a class about those things than is one who has not. Suppose that in this teacher's class there is a student who has experienced these same advantages; he follows the teacher's descriptions with intelligent and delighted attitude in his mind's eye. Even though the other students enjoy her stories, they cannot get from mere words, the picture of what she is telling. They have had no experience with great mountains or with the wonders of Niagara; to them the beauty of the Gulf of Mexico is a vague conception; a panoramic view of a great city from a fifty story skyscraper is beyond their knowledge. But let the same teacher illustrate her talk with pictures projected upon a screen, pointing out details and experiences as she goes, and the class, to a child, is vastly enriched. Each feels that he has been to these places himself and he knows things about them he can talk about to other people. Some day he will go, and he will have a marvelous background for appreciation.

The wise teacher will limit one day's lesson, let us say, to 'Boats on the Gulf of Mexico', or to 'Grand Canyon National Park'. In this way, conceptions are kept clear and there is no confusion of ideas or thoughts. Certain it is that no set of artificial conditions set up in the recitation room can contribute so much to spontaneous self-expression and class discussion as can the properly prepared lantern slide.

THE FILM STRIP

The film strip is a roll of film carrying positive images which are projected on a screen directly by the same principle as is the glass slide. It is a comparatively new form of projection and has developed its own special field of application. For example, when a camera is brought along on a school journey, the record of the trip made with it can be transferred to the film strip and used later in the classroom to give a continuous account of the experiences of the trip and also to provide an instructional follow up procedure.

When, for any reason, a school journey cannot be made or duplicated, or when a teacher cannot utilize the motion picture and the record of such experiences is needed at an advantageous moment, the film strip in its ability to show succession or progression may provide unique means to capture some of the action and continuity that these more concrete forms possess.

The film strip corresponds somewhat to the album or portfolio collection of prints, having the advantages, however, of projection that makes it more desirable for the group study and instruction. It is considerably smaller in size than any corresponding pictorial means with a comparable number and variety of pictures. It can be wound on a small spool and is housed in small metal containers. An entire lesson can be carried in a pocket or handbag. The hazards of breakage are reduced to a minimum, and because of this and its convenient size it can be made easily available to other teachers and other schools.

It is possible to make the film strip directly in colors; many good color results have been obtained. Compared with corresponding pictorial material the cost of the film strip is considerably less than an equivalent collection of glass slides. As the use of the film strip increases its cost will decline for projection work.[17]

If a class is studying the Middle Atlantic States, and the one who is to lead the discussion studies the stereographs showing their industries thoroughly, with the aim in view of explaining to his classmates what he has learned of these industries, the pouring in process is eliminated; the child will be doing his own thinking, using his eyes and teaching others while he himself is learning.

THE STEREOSCOPE AND STEREOGRAPH

The stereoscope itself is an optical instrument with a similar pair of lenses separated by a small wooden partition to keep the right eye from seeing the left view and the left eye from seeing the right view. These lenses are arranged within a hood which fits over the eyes and tends to shut out the light and other possible distractions. When the stereograph is seen through this binocular instrument an impression of depth, or of the third dimension is received. This gives charm and educational value to the picture, as it creates an illusion of reality and seems to trans-

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17 H. B. Gray, Visual Education Simplified, 1936, p. 4.

port one actually into the pictured situation. 'We see something with a second eye and the mind feels its way into the very depth of the picture, around the object and gets an idea of its solidity,' says Oliver Wendell Holmes, who perfected this remarkable device.[18]

Through these interesting devices the great wonders of nature in the remotest parts of the earth are brought truthfully and vividly before us, and great personalities of history, Washington or Lincoln or Wilson, seem so real that we almost expect them to open their lips and speak. This element of truthfulness brings joy and delight to both old and young.[19]

The stereograph is a three-dimensioned picture, produced by the use of two cameras or a double camera, arranged at slightly different angles. These two photographs are enlarged and merged into a single image by the lenses of the stereoscope, thus giving to the observer an illusion of three dimensions which produces a vivid impression of reality. Let it be remembered that the two merged pictures are real. The camera arrangement and the stereograph lenses produce the illusion of reality; and it is this accomplishment that gives to the stereograph its value and outstanding position among the effective tools of teaching.

The stereograph has a use that is different from any other visual aid and it cannot be replaced by the slides or the film in these respects. Neither can it be used for the entire group at

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18 Elsworth C. Dent, op. cit., p. 31.

19 Anna Veronica Dorris, op. cit., p. 137.

once, as can the slide. Hence, one must remember that the stereo-graph is primarily an aid to study just as is a reference book, or the individual experiment in the laboratory. Where formal study periods exist, the stereograph may pass from hand to hand just as a specimen might be passed, each pupil looking in turn while the remainder of the class is busy with the preparation of lessons.

The stereograph furnished intensive ideas. Its great values are its vividness and impressions of reality, as well as its power of depicting the third dimension. The child gets strong impres-sions of acquaintanceship with the situation he sees in the ster-eograph. Everyone remembers scenes depicted in stereographs he saw long ago. These facts are at the bottom of the educational urge to make a larger use of stereographs in teaching. At the same time, a careful analysis of these possibilities make reasonable the suggestion that only a few stereographs, rarely more than one or two, should be presented at a time. In this way, vivid impres-sions will not submerge each other and the whole activity will not become confused, nor will the child get only the superficial and fleeting ideas that so often characterize his reactions to educa-tional pictures of other types. To the stereograph can well be delegated in educational procedures the responsibility of convey-ing one definite and vivid impression at a time.[20]

In addition to making instruction more meaningful, the ster-eograph makes the pupil an active agent, an independent seeker af-ter information. Above all, it gives the child something to talk

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20 Ibid., p. 33.

about--- a schoolroom achievement devoutly to be wished. The material runs the gamut from primary grades through the high school. There are stereographic pictures that contribute to instruction and learning in practically every subject in the curriculum from art to vocational subjects. Good administration makes these available to teachers and provides for their effective use in the classroom.

Some fifth-grade pupils were seeking information on the Grand Canyon of the Colorado. Two girls were standing near the schoolroom window, one looking through the stereoscope and the other awaiting her turn to look at what was evidently interesting the first girl. While the observer was surveying the wonders of the great gorge, she presently thrust her hand in front of the second girl, fearing her companion might step over the edge of the observation rock and be dashed to pieces a thousand feet below. When asked why she held the second back, the first girl replied, "I thought I was standing on the brink with the vast, yawning space in front of me. I was afraid my friend would fall into it."[21]

Stereographs are not intended for group teaching. They are decidedly individualistic and should be so used. Stereographs should be carefully classified and arranged in units of study. They should be housed in a cabinet, should be carefully labeled, and should be easily accessible to teachers. They should be kept free from dust and the face of the pictures free from scratches, which greatly mar the effect. When not in use, the stereographs should be returned to their proper place in the cabinet.

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21 G. E. Hamilton, The Stereograph In Education, 1936, p. 18.

The time is rapidly approaching when all visual aids will be integrated with the courses of study or curriculum units. When there is proper supervision of the use of visual aids, it will mean a decided improvement in the quality of instruction in the schools of this country.

THE OPAQUE PROJECTOR

The architectural principle of form following function holds true in education. In each kind of aid used to help visualize the curriculum the means and methods should be based on the particular purpose involved. Certain situations therefore require other types of projection than those of the slide and film strip. Opaque projection is useful for showing material unavailable as transparencies. Micro-slide projections are for the purpose of utilizing microscope slides. The lecture desk lantern enables the teacher to remain in front of the class during the slide projection and demonstration. "Daylight" projection removes the necessity of completely darkening the room.

All of these various techniques require special equipment and in a lecture room especially organized for projection work, these units may be combined in a single projection apparatus. For the average classroom, however, this would be unwise because of the complications of control and operation that would result. While the need for flexibility is important, it is more effective to concentrate projection work in a single form. The slide projector with film-strip attachment should be the basic unit. During pro-

jection work wide variance in size, quality, color, and type of
the projected picture may destroy the unity of the lesson, cause
distractions, lessening of attention and weaken the dramatic force
of this form of visualization. Projection work should not deter-
iorate into a mere picture show.

Opaque projection is designed to show for group use non-trans-
parent material such as text selections, book illustrations, photo-
graphic prints, drawings, maps, postcards, and certain kinds of
specimens.[22] These materials are reflected as images on a screen
by means of mirrors in the projector. There is a resulting loss
of the intensity of illumination and for this reason opaque projec-
tion generally requires the projector to be placed nearer the
screen to produce smaller images for greater sharpness and clarity.
It should also be noted that transparencies made for projection
need to be prepared as to quality and consistency of tone value.
The materials of opaque projection are not originally planned for
use in the projector; postcards, prints, and colored reproductions,
although to-day they are constantly being improved in quality, may
not produce effective images, and will too often show such a wide
difference in tone and printing that they may defeat the very pur-
pose of their use.

The chief value of opaque projection is that it makes avail-
able for group study a mass of pictorial material not otherwise a-
vailable in transparencies.[23] Such material may cost very little

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22 Dorris, op. cit, p. 171.

23 Ibid., p. 175

or nothing. Color can be shown in its original application. It may be useful in showing material that may also be handled by the individual student for extended study and reference. Specimens, generally flat, such as coins, leaves, mounted and otherwise, may also be placed in the opaque projector to reproduce the actual detail and color.

One caution should be observed. The surface of the material placed in the projector is rarely projected for a long time; for if this is done, it may be seriously affected for future use. Paper will curl under the heat and the projected image will become distorted.

It is often not desirable to darken a classroom for projection purposes. Many classrooms are not properly equipped with the necessary means for total exclusion of light. To overcome any such difficulty, daylight projection may be utilized. Such projection is obtained by throwing the image on a translucent screen, the projector being placed behind the screen. While the room generally may be kept light, the space including the projector and the screen ought to be kept in at least semi-darkness. The larger the image projected, the greater is the diffusion and loss of light.

THE FLAT PICTURE

Although modern science has developed many new and improved picture devices for classroom use, ordinary photographs, prints, and drawings, which are often referred to as flat pictures, are

still invaluable as teaching aids.[24]

Many objectives of instruction do not necessitate the inclusion of motion and action in experience. A study of the pyramids, for instance, does not lend itself to moving portrayal. The essential impression which should result from a study of the pyramids is their immobility. A still picture—— a slide, photograph, or a film strip———— will tend to create this impression. A second impression of the pyramids should be that of mass, immensity, spaciousness, and majesty. These impressions depend on a comprehension of the tremendous size of the pyramids in three dimensions of space.[25]

The flat picture may be used to make more effective the teaching of such situations or subjects as the one given above, where motion or sense of time are not essential to the portrayal of the story.

This chapter will be followed by a nnotated articles arranged in what is, in the writer's opinion, the order of importance with relation to the stated subject. The following chapters will present the annotated material from periodical literature which is the base of this thesis, while the last will present the writer's interpretation of the sentiment of these articles with reference to modern visual education.

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24 Dent, op. cit., p. 70.

25 Hoban, Hoban jr. and Zisman, op. cit., p. 147.

CHAPTER II

WHY A DEPARTMENT OF VISUAL
EDUCATION?

The question has been raised by some educators, "Why a department of visual education?" This question will be answered by the following discussion and annotated articles taken from periodical literature.

Modern visual education no doubt will include the aids of the modern motion picture camera, the lantern slide, and the other branches of modern photography, as applied to educational material. This form of visual education has been forming itself for but a few years and is just now being recognized by educators as having a rightful place in the modern curriculum. But, in a sense, visual education always has been a part of the teachings of the school from the beginnings of education. The ancient Chinese recognized this with their proverb, "One picture is worth ten thousand words". Even in the Middle Ages, when books were copied by hand, pictures were considered of enough value to be reproduced, also by hand, either by artists or through the medium of wood block printing. When printing was invented, pictures formed a good part of many books. Pictures in the form of tapestries and paintings were used to record important historical events. And, when the beginnings of the modern schools were founded, both in Europe and in America, visual aids in the forms of maps (however rough they may have been) and pictures were used in these first schools. So, visual education has always been present, although not always in

the form in which we think of it to-day.

Granting, then, that visual education has always really been a part of the school's teachings, why should we set up a separate department or division within the school to administer it? The reason is this: visual education, in its modern form, is a specialized division of education, every bit as much as is Latin, mathematics, or history. It works hand in glove with all the divisions of the school, yet is separate from each of them, and has its own particular problems which require the attention of a separate division. Some of these problems, which are discussed elsewhere in this thesis, are the selection of proper equipment for the visual education department; the selection of proper material, both projected matter and non-projected matter, for presentation in the classroom; the correlation of the visual matter presented with the academic curriculum, both in time and in subject matter; and the mode of presentation of visual aids.

The above named tasks are the main duties or functions of visual education. If all these duties are properly performed, the department will be a definite asset to the school or schools in which it functions, and will help them to carry their message to students more effectively. Modern visual education, however, is a comparatively young department of education, and has a long way to go yet. While much progress has been made in the direct value of the material presented so far as classroom interest is concerned, it is still a fact that many of the classroom visual aids used by otherwise modern schools are still as dry and uninterest-

ing as the books they seek to supplant. This thought should not be misunderstood. The function of the educational picture is not to entertain, but to teach; but if it cannot teach in a more interesting manner than the book it replaces, it is of no value so far as raising the standards of education is concerned. There is much room for improvement in educational pictures in this respect.

Another duty of the department of visual education is to see that the teachers, and through them the pupils, make proper preparation and after-use of the visual materials presented. Pictures may be good in themselves, but, unless they are properly presented and properly followed up to keep the message they have carried fresh in the pupil's mind, their full worth has not been utilized. These who use visual aids in their teaching programs should remember that visual aids can only help in putting over a message, and cannot supplant regular classroom and library work. On the contrary, the more visual aids that are used, the more the correlation of these aids with the textbooks used and with outside material should be stressed.

The reason, then, for a separate department of visual education is that visual instruction requires much attention to detail, both in its educational and mechanical processes. Because of this, it should not to made incidental and subservient to other work, but should have a place of its own in the curriculum of the modern school.

Further material and discussions on this subject will be found in the following articles. The gist only of each article

has been given; in many cases, reading of the original article will
prove helpful to educators seeking further knowledge of this part
of visual education.

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(1) D. C. Thorton, " Why a Department of Visual Education",
Educational Screen, 15:46, February, 1936.

The purpose of the department of visual education is to make
easier the learning process through improvement of the teaching
procedure. Perhaps in no department is a supervisor needed more
for such a purpose. The value derivable from an intelligent use
of visual aids warrants the organization of such a department and
the instruction with such aids will be greatly improved by a sys-
tematic organization, under a qualified supervisor who enlists and
encourages the instructional staff in this old but newest venture.
Very few institutions of higher learning offer courses of instruc-
tion in the effective use of visual aids. Only one state in the
Union (Pennsylvania) makes it compulsory for every teacher to have
a course in Visual Education.

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(2) H. F. Hughs, "Starting a Visual Education Department",
Educational Screen, 8:4-5, January, 1929.

The best Visual Education Center is a monumental waste of the
public funds unless the materials there stored are used to improve

instructional methods. In starting a new department there is considerable merit in having a slow growth. It enables one to get his accounting system in order. Mimeograph sheets of paper to be sent out by departments with the head, 'What do you wish from the Visual Education Department?' Below, provide a space for the teacher's name, then columns headed..Flat Pictures..Films..Lantern Slides.. Exhibits..Stereographs..Maps.

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(3) H. A. Henderson, "What Should A Course in Visual Education Include", Educational Screen, 11:186, June, 1932.

A well equipped laboratory for a course in visual instruction should contain: a blackboard; bulletin board, maps, models, museum, collections, projection apparatus including two or three types of stereopticon machines, direct and indirect projectors, strip and filming picture machines, talking picture machines, several types of screens, stereographs and stereoscopes, sand tables, commercial catalogs from various educational equipment concerns, necessary material for making poster cartoons and graphs, and flat pictures applicable to the teaching of definite lessons to be mounted and catalogued by the student.

In order that the students of this visual method of teaching may derive full benefit from the course it is necessary that each one should do some supervised practice teaching following the recognized psychological lesson procedure. The following purposes should be kept before the class:

1. To give a background of correct imagery for descriptions outside of the child's experience.

2. To motivate silent reading.

3. To make the lesson vivid and interesting.

4. To focus the attention of the entire group upon a given subject for socialized class discussion.

5. To create an atmosphere for the teaching of appreciation and literary interpretation.

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(4) E. I. Chambers, "Are You Interested in Visual Education?" Educational Screen, 12:122-3, May, 1933.

Visual Education---- the "seeing, hearing, doing method"----
Six objectives for the organization and development of a visual education department in the elementary schools.

(1) Keep all equipment clean, attractive, up to date, and in good condition for use.

(2) Darkened room, well ventilated, machines on solid bases, pictures clean out and well framed, chairs in correct position and children in healthful positions.

(3) Sum up the kind of films to use, the preparation for the lesson, and the correlation of the picture films with the text lesson.

(4) Choose pictures for content, correct light, and do not use too many pictures at one time.

(5) Use models, exhibits, marionettes, and puppets as tools

in teaching.

(6) Each piece of laboratory work should be an inspiration to carry over its high interest to the development of the next lesson. Take field trips---- from kindergarten through high school.

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(5) E. E. Macy, "Why Visual Education Now?" Educational Screen, 11:293-5, December, 1932.

Visual aids actually save money to a school where their use has been evaluated. Of all the visual aids sound motion pictures are one of the most effective types. The use of sound motion pictures is a means of international communication which will eventually bring about the thing necessary to human understanding and progress.

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(6) W. B. Adams, "Broadening the Horizon of Visual Instruction", Educational Screen, 12:72-3, March, 1933.

No longer can the enjoyment of motion pictures, stereographs, models and the like be looked upon as a passing fad, for their values in creating vivid, lasting impressions has been scientifically proved, by both research and practise.

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(7) W. J. Hamilton, "Importance And Role of Visual Education In Our Schools", Educational Screen, 12:156-7, June, 1933.

There are at least seven significant aspects of visual instruction which come to mind in the consideration of the importance and the role of visual education in the modern school.

1. From the psychological standpoint, what is the status of visual education?

2. What is its place and function in our educational program?

3. What types of visual aids are now available for use in the schools?

4. What are experimental researches contributing to the more intelligent use of visual aids?

5. How shall we adopt visual education to the typical school situation?

6. Upon what basis can suitable visual aids be provided for school use?

7. What is the contribution of visual education to the ultimate ends of education?

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(8) J. M. Levelle, "Efficiency in Visual Instruction", Educational Screen, 14:36-8, February, 1935.

Maximum benefits are derived when the class is shown visual aids when the showing is made during the time that the information it contains is being studied in the classroom.

Lists of questions, assignments of topics relating to subject matter may be given before slides are shown. Words, even when reinforced by illustrations from texts are not nearly so effective as they can become when the pupil can be shown visually, the subject matter under consideration. It is seldom possible to take a class through a steel plant, but the steel plant can be brought to the class in the form of an excellent five reel motion picture.

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(9) W. Emmert, "Visual-sensory Aids in Education", Educational Screen, 55:75-82, October, 1934.

Visual education, like other phases of school material and subjects, has arrived at its present status through an evolutionary process. Scientific research has rather definitely determined both the subject-matter and the method employed. With the realization that sensory experiences form the basis of all intellectual activity has come the conviction that visual-sensory aids must continue to remain an integral part of the educational system of the world.

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(10) F. D. McClusky, "Basis Values in Visual-Sensory Instruction", Education, 55:65-70, October, 1934.

Visual-sensory instruction emphasizes the value of concrete imagery in the learning process, whereas "other instruction"

stresses the importance of verbal imagery.

1. There is a strong movement in schools to centralize visual-sensory materials.

2. In general or special methods textbooks in education, little attention has been given to the use of visual-sensory material.

3. Visual materials are valuable aids to the successful teaching of practically every subject, because they furnish the concrete elements necessary for the complete understanding of the subject matter.

Teachers should talk less about "education for life" and other high sounding verbialisms, and proceed to introduce concrete experiences of every sort into the instructional process, so as to make word patterns dynamic.

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(11) C. F. Hoban, "Value of Visual Aids In Instruction", American School Board Journal, 86:41, April, 1933.

All persons engaged in school work should know the values of visual sensory aids in the instructional and learning processes. These values have been definitely determined through scientific processes. A recent analysis of the major experiments with visual aids and an examination of the studies of graduate students offers reliable information that proper use of visual materials increases initial learning, increases the permanence of learning, motivates learning by increasing interest, voluntary reading, and classroom participation.

All visual-sensory materials for teaching purposes can be classified as (1) apparatus and equipment, (2) school journey or field trips, (3) objects, models, or specimens, (4) pictorial materials, and (5) miscellaneous data, such as demonstrations, exhibits, and other aids.

Room for housing---- The wealth of pictorial material now available makes a knowledge of their values, guiding principles, and technique absolutely necessary to effective teaching. Every teacher should be required to take a course of instruction in the use of visual aids. The acceptance of such a responsibility means that a genuine contribution will be made to improve instruction in the schools of this country.

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(12) V. L. Kooser, "Present Trends In The Use of Visual Instruction", American School Board Journal, 80:56-7, February, 1930.

Visual instruction is defined as the enrichment of education through the seeing experience. Too many times we think of visual aids only as motion-picture films, stereopticon slides, and film slides. However, there are many other very important visual aids. Consider the following:

Apparatus	Cuttings, magazine	Globe
Blackboard	Diagram	Model
Bulletin	Dramatization	Map
Cartoon	Drawing	Motion Picture
Chart	Exhibit	Museum

Pageant	Sand Table	Specimen
Post Card	School Journey	Stereograph
Poster	Sketch	Tableau
Print	Slide	Textbook Illustration.

One of the important developments in visual instruction is the interest that educational institutions are taking in the subject. There are four different types of visual instruction that may be considered as service organizations in the visual field.

(1) Approximately thirty-eight cities have centralized departments in direct connection with the public school system; and some very fine work is being done in such cities as Los Angeles, Pittsburg, Chicago, etc.

(2) The state extension bureaus in the universities and colleges serve a very important place in the field of visual instruction.

(3) The states of Ohio, Pennsylvania and New York have state bureaus of Visual Instruction.

(4) Several states have visual-instruction organizations, such as the one in Iowa, which is a section of the Iowa State Teachers' Association.

Developments are taking place rapidly in educational pictures. Talking picture film slides, lantern slides, and emphasis on the coloring of slides; 16mm. and 35mm. and single frame pictures are shown.

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(13) E. R. Enlow, "Trends in Visual Education", *Educational*
      Screen, 10:71-2, March, 1931.

Some outstanding trends in the opinion of the writer, are:

(1) The increasingly wider dissemination of information.

The last decade, and more especially its declining years, has
served to acquaint many in the educational field with the renewed
emphasis on the use of visual aids in education.

(2) Better understanding of the breadth of the movement.

Teachers are learning that visual education is more than a
picture shown on a screen and that they are beginning to realize
that activity programs have a strong visual emphasis and that
artificiality must give way to realism in instruction.

(3) Less dogmatism about the 'Most Important' visual aids.

The inclination of the teacher, type of student group, na-
ture of subject, accessibility of visual aids must be considered.

(4) The increase in the numbers of the school systems having a
     city-wide visual instruction program.

(5) The shift from wholesale circuit routing to selective option-
     al call.

(6) Uncertainty about the future of film projection.

(7) Lessening emphasis on special technique and formality of
     presentation.

(8) Increased appreciation of the part played by visual aids in
     simultaneous learning.

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(14) A. V. Dorris, "Universal Educator", Sierra Educational News, 32:29-30, March, 1936.

To-day we must look upon the motion picture particularly as one of the outstanding achievements of modern times. It must be reckoned with as one of the great educational forces of contemporary life.

Let us consider for a moment just what the motion picture can do for public education that cannot be done so efficiently by other means, such as textbooks, the well-trained teacher, lecturer, or even radio.

(1) Expert teaching by world's outstanding specialists.

(2) International understanding for our foreign neighbors.

(3) Training of teachers---- can bring special educators of each pupil.

(4) Simplify the problems of adult education and bring a richness to life.

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(15) C. F. Hoban, "Some Neglected Factors In Visual Instruction", Educational Screen, 14:257-8, November, 1935.

1. The place of visual aids in instruction is a function of (a) the educational outcomes which are set for instruction, and (b) the mental development, or previous concrete experience, of the children in relation to the particular subject matter of instruction.

2. The amount of visual instruction in relation to any particular outcome of instruction is a function of (a) the intellectual level of the pupil, (b) his previous experience in the subject, and (c) the difficulty of the learning material.

3. The types of visual aid to be used will be determined by (a) the previous experience of the pupil, and (b) the type of learning outcome desired.

4. Technique of use of visual aids are (a) presented with or without verbal accompaniment, and (b) verbal instruction before or after.

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(16) G. H. Bretnall, "Neglected Phase of Visual Education (opaque projection)", Educational Screen, 10:107-8, April, 1931.

One great fault of our schools is the spending of precious teaching time imparting bare facts and neglecting to develop the thinking power of the pupil. The field of picture teaching is unlimited. One of the most productive sources has been lantern slides and there are hosts of slides to choose from. Because of the difficulty in obtaining lantern slides the stereopticon side of teaching is neglected. With opaque projection almost any kind of picture can be shown. The light is thrown on a common printed image, picture, or actual object, and the image is reflected by mirrors through the lens of the stereopticon and onto the screen. Since the light does not need to go through the picture, as in a lantern slide, it matters not what kind of picture is used, post

card, print, even book illustrations. Machines vary, but most of them show a picture 6 inches by 6 inches.

These opaque reflectors are made by the leading stereopticon firms and are expensive, but last a long time.

Objection is often made to opaque projection in that the picture lacks clearness and strength. This can be corrected if the apparatus is rightly used.

The available materials for opaque projection are almost unlimited, and they can be made a major part of visual work in schools.

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(17) F. D. McClusky, "What Next In Visual Education?", Educational Screen, 15:84, March, 1936.

Visual instruction has long since passed the bally-hoo stage. The question that constantly is being raised is where can material be secured. No one needs to be sold on the value of visual material. A thorough study of the economy of using visual aids is needed.

The situation in visual instruction is parallel to the development of textbooks. The best textbooks grew out of classroom experience and are prepared with the aid of pedagogical experts in close cooperation with intelligent ideas on visualization of their teaching needs can make a satisfactory picture for illustrative purposes. It is apparent that soon companies will take this teacher-made material and revamp it, edit it, and manufacture it in

quantity on a quality basis just as text materials are also being produced.

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(18) W. F. Barr, "Next Steps in Visual Education", Education, 53:350-2, February, 1933.

There are some difficulties to confront teachers interested in visual aids. When will good lanterns and motion picture machines cost less? Why cannot suitable entertainment films of two or three reels in length be had to put on during school time in elementary schools? Those available are not suitable in subject matter.

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In this chapter eighteen annotated articles dealing with various sides of the question, "Why a department of visual education?" have been included. These articles, written mostly by educators or those closely allied with the schools, were taken in the main from Educational Screen, a magazine given over to the problems and needs of the visual education movement in the school.

The trends indicated by this chapter show that the modern educator is recognizing the value of visual education when used in conjunction with properly prepared academic material. The modern educator, too, is recognizing that, while the department of visual education has its problems closely allied with each other de-

partment of the school, that it has problems of its own which entitle it to be set aside under administration of its own. Particularly is this true in the case of large schools; and even in small schools, some teacher or teachers are being appointed to take charge of the school's visual education program.

FURTHER READINGS

(1) C. J. Anderson, "Some Unsolved Problems in the Development of Visual Education," Educational Screen, 15:73, March, 1936.

(2) C. E. Wyman, "Visual Aids of What Worth?" Science Education, 16:291-6, April, 1932.

(3) J. S. Sigman, "Organization On A Department of Visual Education", Junior-Senior High School Clearing House, 16:214-18, December, 1930.

(4) M. W. Arleigh, "Scope of Visual Education," Educational Screen, 9:269, November, 1930.

(5) L. H. Westfall, "Future of Visual Instruction," School Executive, 54:6-7, September, 1934.

(6) W. W. Whittinghill, "Functions of a Central Visual Education Department," National Elementary School Principal, 13:185-92, June, 1934.

(7) S. R. Butler, "Visual Education," National Elementary School

Principal, 14:88-90, December, 1934.

(8) W. H. Dudley, "Systematic Visual Education in Average School," _Educational Screen_, 14:228-9, October, 1935.

(9) F. A. Rhuland, "Building A Visual Educational Program," _Educational Screen_, 14:281-2, December, 1935.

(10) G. A. Stracke, "What Is Being Taught in Courses in Visual Instruction?" _Educational Screen_, 11:204, September, 1932.

(11) E. R. Enlow, "Visual Instruction As a Means to an End," _High School Teacher_, 6:200-1, May, 1930.

(12) J. M. Miller, "Discussion Of Visual Education Experiments Give Tangible Results," _Journal English Education_, 23:59-61, September, 1932.

(13) Harold Levine, "A Critique of the Educational Film," _Education School_, 16:13-14, January, 1937.

(14) John S. McIsaac, "What the Supervisor Wants in Visual Education," _Education School_, 16:151-152, May, 1937.

(15) H. A. Perrin, "Controversial Problems in Visual Education," _Educational Screen_, 15:105-6, April, 1936.

CHAPTER III

FLAT PICTURES

Flat pictures are classed as those kinds of pictures which are represented, either through photography or artistry, in two dimensions and, naturally, on flat media, such as pages of books, flat pieces of paper, blackboards, posters, etc.

Flat pictures, as above defined, form one of the oldest of the visual aids now used in modern visual education. The first pictures drawn by the ancient cave-men were flat pictures; they represented the cave-man's best conception of the three-dimensional wonders which surrounded him. These first flat pictures were merely plain outline drawings, with no suggestion of reality about them. As the years went by and civilization increased, the artists who drew pictures learned how to simulate, with clever strokes of shading, the three-dimensional effect of solidity one sees in the original object. This secret was passed down from hand to hand and added to until a comparatively short time ago, when the science of photography came into being. Photography banished the necessity for laborious sketches or drawings representing objects, since a photographic picture is easily made and any number of reproductions can be made from it. The early photographs, however, lost one of the best features of artistry; they gave flat, monotonous pictures, lacking solidity and life. As men grew more experienced in photography, they learned how to project this reality of light and shadow, this three-dimensional likeness, into photographs, until the modern flat picture (Photograph) fairly

breathes with lifelike likeness. It is these photographs which form the majority of the flat pictures used in modern visual education.

Modern pictures supplanted the old, hand-drawn illustrations and the later woodcut because they were easy to make and easy to reproduce (print). Since then, new methods of photography have been developed which make the first photographs as obsolete as they rendered the woodcut. The modern picture may be taken and reproduced either in monotones of one color or in full, natural color as the scene actually occurs. Pictures may be taken of the smallest speck of matter, of the farthest star, and of the fastest action--- each one presenting the subject in a form easily seen by the viewer. In fact, no adverse condition need deter the modern photographer, since he no longer need pose his subject save for the fraction of an instant needed to expose his film.

With this variety of material available, it is a wonder that the modern flat picture is not used more in visual education. Students of geography may see customs in far-off lands, depicted in full natural color. Students of history may visit historical settings by proxy of the camera.

The most frequent occurrence of flat pictures is, of course, as illustrations in texts. Next, we find them used as posters and as decorations or illustrations for rooms. The first use is the oldest, and, possibly, the most effective; since the picture (a direct concept) is combined directly with preparative material and supplementary or explanatory material in the form of the printed

word. The book, then, with the aid of illustrations, can tell a story. It is important to note, however, that the stories the books tell would in many cases fall flat were it not for these very illustrations. Posters or wall pictures, on the other hand, are accompanied by no written explanation save a title or caption, which tells the story of the picture. Such other material as is necessary to tell a story with the aid of the picture comes from outside sources.

If the limitations of the flat picture----- namely, that it cannot portray motion, time, nor tell a complete story by itself---are recognized, it can be made very valuable in classroom lessons. If the teacher will make a proper preparatory lecture, then introduce flat pictures either singly or in series to illustrate his point, then the message will go much nearer home than it would without illustrations to make it clear and to hold the class interest.

The following articles present the views of visual educators with reference to the advantages and limitations of the flat picture. Note especially the mentioned variety of flat pictures available outside of the photograph.

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(19) Paul L. Anderson, "The Appreciation of Photography," American Photography, 31:457-476, 1937.

There has been much argument over the question of whether or not photography is a fine art. The answer is definitely yes------

and no. No form of expression is necessarily fine art. The banalities of our magazine advertisements are not fine art. But if we look at the photographs of D. O. Hill, Clarence White, George Seely and many others, we see that it is follish to deny photography a place among the fine arts merely because the camera is a machine. It is no more mechanical than the brush, the chisel, or the T-square; it is a tool, and art does not depend on the tools used, but on how they are used. In the hands of an artist, the camera produces works of art.

It is a mistake to think, as many do, that the technique of photography is easy. It is not. With the possible exceptiom of architecture, photography is technically the most difficult of all the arts.

In the endeavor to produce works of fine art by means of the camera, there are, broadly speaking, two methods of approach, which we may call the esthetic and the pictorial. It is a mistake, also, to think that photography is a representative art. No graphic art is representative; all are symbolic. And, unless we know the symbols, the art means nothing to us.

There is one point in which photography surpasses all other graphic mediums; that is its ability to represent the graduation of light on any surface.

The father of pictorial photography was David Octavius Hill, a Scottish painter who, about 1840, planned a huge historical painting representing the disruption of the church of Scotland. Since this involved some 400 portraits, he despaired of being able

to get so many sittings, and turned to the newly discovered science of photography for help.

Then, for many years, photography was sterile, giving us nothing of lasting worth. But, about thirty years ago, a number of photographers discovered that there was more to photography than simple record work. Their idea--- and ideal--- was to produce pictures which would be interesting, and sound in composition and beautiful in their tonal relationship. By force of doing this, they were the ones who raised photography from the status of a craft, and showed very definitely that the camera, handled by an artist, could produce genuine works of art.

Interest a picture must have; sound composition it must have; these things are fundamental, whether it be a permanent thing of beauty or merely an ephemeral exhibition print. Beyond this, there is the question of esthetic beauty, of the artist's sensitiveness to a fine relationship of tones and masses of lines and forms; of his sensitiveness to beauty of surface; and of the way he treats these things. And still beyond this, there is the question of whether or not his work betrays a passionate love for what he is doing.

In evaluating photographs, our own as well as those of other workers, there are a number of questions that we may ask ourselves. First, is the picture interesting? Does it remind us of things that we are glad to recall? Next, does it remind us agreeably of these things? Third, was the artist sincere; did he make this picture because he truly wished to express or record the beauty of

nature? Fourth, does it show signs of having been made with thought and loving care? Fifth, has the photographer told us all he knows, or has he suppressed details, softened out lines? Sixth, are his compositions and arrangements of tonal relationship beautiful?, Seventh, has he availed himself fully of the camera's incomparable power of rendering the graduations of light on surfaces? Eighth, has he chosen a printing medium which is in itself esthetically beautiful, which has charm of its own, regardless of what it says? If we can answer all these questions with approval, we may be sure that the picture is a work of fine art——— how great depends on the depth of the emotion which it stirs in the mind. But that is a question of the greatness of the artist's soul, and is beyond all rules.

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(20) A. P. Murray, "Natural Color Photography", School Science And Mathematics, 35:747-55, October, 1935.

The earliest available records of the human race contain evidence of attempts to portray or reproduce the beautiful colors of nature.

The discovery of the sensitivity of silver halides marked the arrival of a method of reproducing nature more accurately than thitherto. It was the starting point of the photographic era.

It was not until 75 years ago that any definite progress was made in the attempt to reproduce the colors of nature by means of photography.

The possibility of reproducing objects in natural colors by photography was first suggested by Clark Maxwell in 1861. Maxwell reasoned that if the eye could separate and reunite the colors that possibly the camera could. He proceeded to carry out his experiments using ammoniacal copper sulphate to isolate the blue, copper chloride for the green and iron-sulpho-cyanide for the red. For some reasons, Maxwell added a fourth filter and used a piece of common yellow glass for the yellow. When the picture was adjusted on the screen, we had our first colored picture.

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(21) Warren T. Mithoff, "Some Notes On Color Printing", American Photography, 31:90-91, February, 1937.

The facilities for reducing prints in natural color, such as are afforded by Eastman Wash-Off Relief Films, open up a new vista to may an advanced amateur and professional photographer. Many such workers experiment briefly with the process, but fail to establish a standardized technique, thereby achieving disappointing results, and finally give it up as beyond their skill.

In general, it may be said that the process (like all color processes) is a lengthy one. Painstaking care is needed at every stage.

First, regarding the making of negatives. By all means use the graduated step wedge in every scene, indoors or out. I use a 5 x 7 view camera for most of my color work, usually with a 4 x 5 reducing back. It is almost too much to expect a set of negatives to

come out perfectly balanced. Use a bromide paper the size your print is to be printed.

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(22) C. A. Crowley, "Linoleum And Para Blocks", Industrial Arts And Vocational Education, 22:208-12, June, 1933.

Linoleum and para blocks may be used in the high school print shop for cutting ornamental initials, posters, etc. The marking of these printing blocks not only serves to correlate the work of the art department with that of the print shop, but in addition it opens new channels of expression to the students which may be according to his native ability.

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(23) M. Reed, "Block Prints of Your School", Instructor, 42:51, November, 1932.

Making a block-print post card of one's school is certain to be a popular art project. These post cards might be sold to realize a small fund for a desired object.

First, make a pencil sketch of the building. Put the design in reverse on the linoleum. Then cut the block having the design in relief. Then block or have printed at any printing shop.

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(24) W. B. Hunt, "Block Prints From Photographs", Industrial Arts
And Vocational Education, 23:378-379, December, 1934.

Make the desired print and with black water color go over the
darker portions. The grey and the white portions should be gone over
with Chinese white. Make the lines simple. In this way the photo-
graph is given the desired black and white that must be used in mak-
ing linoleum blocks. The white part is to be cut away. Carbon copy
the design to the linoleum and print in the usual way.

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(25) A. Murray, "How To Make Silhouettes", School Arts Magazine,
29:286-7, January, 1930.

First draw a square of any size. In the square draw a circle
exactly in the center. Start the nose of your model and be sure to
start it below the center line. Draw the mouth, chin, and then the
forehead and hair. Look for little individual touches. If possible,
show your subject with a white collar and white tie or bit of ribbon.
Silhouettes are often clipped with scissors out of black paper. They
may be painted or filled in with black ink.

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(26) N. M. Drew, "Plaque Silhouettes", Instructor, 42:464, Feb-
ruary, 1933.

Make the plaque of two parts of water and one part Plaster of
Paris. Grease the tin with vaseline, fill tins and apply a curtail

ring in the back for hanging. After about ten minutes the plaque will be hardened. Remove from the tin pans. To this apply on the front side a picture to fit the plaque.

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(27) W. S. Rice, "White Silhouettes of Plant Forms In Linoleum Block Prints", School Arts Magazine, 34:592-4, June, 1935.

Coat the linoleum block with a thin wash of white paste paint. Secure pressed sprays of leaves or specimens and pin them on the linoleum. Dip a toothbrush in India ink or black poster paint and jerk it briskly over a knife blade using a forward movement only. Remove the specimen. This will leave a white print on the block. Cut away the white sections. Various tones may be secured by the use of colored papers and colored ink.

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(28) R. Sanchez, "Faces", School Arts Magazine, 34:200-1, December, 1934.

Caricature has long been scorned by many teachers (with exceptions, of course). To classify it under the title of cartooning, which to them is a means of ridiculing art, is their view. But a caricature is not a cartoon. It is a work of art. A vital, living thing, full of character which in most instances displays a sympathetic understanding of human psychology. The slightest exaggeration of a line might denote such things as strength or weakness in a face.

(29) A. Mitchell, "Silhouette Cartoons Made With Circles and Parts
       of Circles", <u>School Arts Magazine</u>, 36:24-5, September, 1936.

Figures made with circles or parts of circles for different parts
of the body are used here. Certain of these suggested themselves as
particularly suitable for cartoons by moving their heads at various
angles to suggest comical movement.

The children asked classmates to pose to help them visualize
just the actions they were trying to show in their figures.

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(30) Marion Louise Isreal, "Picture Helps For Smaller Schools",
       <u>National Education Association Proceedings</u>, page 953-7, 1931.

A broader and deeper purpose in education is working changes
in classroom procedure.

These new classroom procedures demand a wider range of materi-
als of instruction than textbooks and maps and paper and copybook.
We feel the need of materials that possess more or less of motiv-
ating or interest arousing possibilities; perhaps these possibili-
ties are most apparent in the newer types of books which are of un-
failing delight to children. These things are of surpassing beauty
and power, which stir something within us. Pictures---some pictures
are among these things and experiences.

Lantern slides and films are pictures which serve the same
broad purpose.

A motion picture film is perhaps the nearest experience to an

excursion, since it duplicates actual experience as nearly as it is possible to do.

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(31) Jacob Deschin, "Greeting By Photography", Scientific American, 153:284-5, November, 1935.

The making of greeting cards by photography appeals enormously to the imagination, for it leaves one free to roam the whole world of fancy and fun to choose the design suitable to the occasion and the person for whom it is intended.

Bookplates may also be designed and completed by the same method employed in making one's bookplates; different ones may be designed for different classifications of books in one's collection, such as volumes of history, fiction, poetry, and so on.

"The Season's Best" card was made by projecting a cardboard cutout of a window with a piece of cheesecloth thrown over one side of it to simulate a curtain.

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(32) F. E. Ives, "Color Photography", American Photography, 31:564-5, August, 1937.

When the Daguerreotype process appeared nearly a century ago, it was almost universally believed that it would soon be followed by an improvement which would secure the direct reproduction of natural colors as well as light and shade.

It was not until 1888 that Ives, recognizing red, green, and
blue as the 'Primary' light colors, made a famous convincing demon-
stration of the additive process of color photography, and followed
this up with subtractive process color transparencies in which the
minus transparent prints in blue, magenta pink and yellow were super-
posed in register. All further developments of color photography as
we know it to-day were initiated by and have grown out of these
first successfull Ives demonstrations.

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(33) Henry S. Canby, "Comic History", Saturday Review of Literature,
10:108, September 16, 1933.

If there were an adequate history of humor it would be seen
that it has its shifts, and that they coincide, not with war, nor
with revolutions, but with deeper changes in man's spiritual atti-
tudes, the kind of mental or spiritual shift which precedes earth-
quakes in society. The new brutality in Western civilization, best
advertised in Italy, Ireland, and now in Germany, though it is no
local phenomenon, has been for years the stuff of the comics.
Every action is violent, every fall an explosion, every strip has its
casualty. None of this was taken seriously by the American people.
The comics were an index to the times, and are so to-day.

Equally striking has been the trend against democracy visible
in the comics for at least twenty years. The essence of their
humor is making a monkey of the everyday, commonplace man who is
the backbone of democracy.

But if the comics have prophesied for many years now that the end of the American superstition that one man is as good as another is in sight, there is no clear light thrown upon what is to take its place. All you can say from the comics is that violence is taking the place of the humanitarianism which thirty years ago would have had little children reading stories of boys and girls who were successful because they were kind and good, and that a tolerant contempt for the average man has ousted a spreadeagle faith in the democracy.

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(34) L. Trolinger, "Characteristics in Still Pictures For Instructional Use in The Classroom", Educational Screen, 14:271-19, October, 1935.

We can expect no great progress in this field until the teachers know why the aids are needed, have certain standards by which such aids are judged and know something of the best methods——— insofar as they have been determined——— for the use of the aids.

Some states, notably Pennsylvania, have provided for this training very adequately ; but many states have relatively few teachers who really know how to use the usual aids that are put into their hands. Teachers should know the following: Technical Quality, 40 points———— a picture should be artistic, clear and definite, free from blemishes, of practical size, and properly colored. Instructional Quality, 60 points———— truthful, authentic, significant, stimulative and suggestive of size.

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The chapter on Flat Pictures includes sixteen annotated articles, the majority of which were taken from The School Arts Magazine, and which were written by those familiar with educational problems as applied to visual education.

The major conclusion made in this chapter is that the flat picture plays an indispensable part in modern education. It is shown that, without the flat picture, that modern books would be sorry parodies of the efficient teaching machines they are. It is also shown that flat pictures, as used to-day, are not limited to the black and white photograph or line reproduction. Illustrations or posters in color, silhouette, etchings, wood blocks, and other media are possible; and, with the modern camera, it is possible to show motions that are so fast or scenes so small as to be invisible to the naked eye. This last feature has been shown to be particularly indispensable in scientific subjects.

FURTHER READINGS

(1) A. M. Brown, "Processing Paper for Silhouettes", School Arts Magazine, 32:154-5, November, 1932.

(2) A. Keil, "Using Linoleum Blocks", Industrial Arts and Vocational Education, 33:288-93, January, 1934.

(3) D. R. Fitzpatrick, "Our Times In Cartoons", Forum, 91:38-9, January, 1934.

(4) W. E. Berchtold, "Men of Comics", New Outlook, 165:34-40,
     April; 165:43-7, May, 1935.

(5) M. B. Diller, "Block Print Album", School Arts Magazine,
     January, 1933.

(6) H. R. Snook, "Inexpensive Etching For High School Pupils,"
     School Arts Magazine, 32:138-9, November, 1932.

(7) D. H. Simms, "Silhouettes In Art Correlation," School Arts
     Magazine, 32:154-7, October, 1932.

(8) L. D. Tessin, "Allover Patterns From Small Linoleum Block
     Prints," School Arts Magazine, 32:218-21, December, 1932.

(9) C. Shelby, "High School Block Printing," Design, 37:12-12,
     November, 1935.

(10) K. F. Oerlein, "Project For The Photographers," School Science
     And Mathematics, 31:857, October, 1931.

(11) "Third Nation-Wide High School Cartoon Project," National
     Education Association Journal, 21:270, November, 1932.

(12) O. Reed, "Etchings and Itchings," School Arts Magazine,
     34:247-9, December, 1934.

CHAPTER IV

PROJECTED PICTURES

In this discussion will be included the following types of pictures: (1) silent motion pictures, (2) sound motion pictures, (3) lantern slides, (4) stereographs, and (5) film strips. A short discussion on the possibilities of these types of visual education will be in order.

Motion pictures, it is generally conceded, present the best opportunity in visual education. Where a still portrait may represent only one stage in the manufacture of an article, a motion picture can portray the whole process of manufacture graphically, easily, and quickly. It can tell a story far better than the drab, uninteresting pages of a book. It surpasses by far the interest of a series of diagrams and pictures which the teacher may lecture upon. Motion pictures may be presented in either the silent or sound versions. All that has been said before holds for the silent version of the motion picture. When we add sound--- either synchronized or incidental--- to the silent motion picture, its value in visual education grows immeasurably. The addition of sound enables the listener or pupil to gain a complete concept of the thing portrayed. Too, a thing may be presented not only as it actually appears, but the various devices of modern motion picture photography, such as slow motion, microscopy, the use of the telescope, and animation, may be used to paint a picture, which, when done in the written or spoken word, would be pale and unappetizing at best. Industrial processes may be portrayed through animation, actual photography, or

a combination of both. Slow motion may be used to analyze certain
motions. Through time-lapse photography, the miracle of the budding
of a flower, a process of days, may be shown on the screen in diges-
ted form in a matter of a few minutes.

Though motion pictures present almost the best opportunity in
visual education, the lantern slide has its rightful and proper
place in visual education. It is either a black and white or color-
ed picture, projected on the screen in much the same manner as the
motion picture save that it presents but a single picture at a time.
It is valuable where there is not a whole story to be told as in
the case of the motion picture. It portrays single parts or scenes,
and, when accompanied by adequate explanation by the teacher or
study and research on the part of the student, is of much value in
giving true and balanced concepts of a subject. The more general
practice in visual education to-day, as shown by the research of
this thesis, is to show a complete set of slides, covering, picture
by picture, all of a unit of study, instead of showing just a few
slides covering more of the important points.

Stereographs and stereoscopes perform much the same office as
the lantern slide at a little less cost, and serve to give the view-
er of the picture a three-dimensional conception of the scene por-
trayed. Unfortunately, however, the use of the stereoscope is
limited to individuals and cannot conveniently be used for group
instruction. Work is being done, however, on stereoscopic effects
in lantern slide and motion picture projection. Indeed, several
processes for achieving this end have been patented, and, before

long, the schoolroom may be able to see stereoscopic effects in their projected pictures. When this is done, educators will be able to couple the advantages of the stereoscope and group instruction in visual education.

Film strips, the last mentioned mode of projected pictures, perform the same functions as do magic lanterns and stereographs. That is, they project individual pictures before the class. Their advantage, however, lies in the fact that, instead of each picture being composed of a bulky glass slide, it is a frame or individual picture on a thin strip of regular cellulose film. This, naturally, requires less space for storage and shipment than do lantern slides. Film strips also require smaller projectors than do lantern slides.

The purpose of this unit is to present material from periodical literature giving suggested ideas on the possibilities and use of the projected picture in visual education. This unit shows that educators have long recognized the value of the projected picture, and that it has taken its place in modern education.

The following annotated articles embrace the points discussed briefly above. They represent the sentiment of educational periodical literature with reference to visual education in the curriculum of the modern school, and present the ideas and findings of educational men in the use of visual aids.

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(35) D. C. Knowlton, "Place Of The Motion Pictures In A Program Of Visual Education," Junior-Senior High School Clearing House,

5:195-200, December, 1930.

It is unfortunate that a program of visual instruction is conceived as a series of motion picture 'shows'. The purpose of visual education programs is to acquaint the child with life and its manifold activities with the most economical expenditure of time and effort.

The theatrical motion picture is not designed to be educational, but to amuse. A motion picture, to serve the schools, must recognize that the supreme aim of the school is instruction, not entertainment; and the motion picture must be as carefully adjusted to, and integrated with, the rest of the school program as is a bit of laboratory equipment.

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(36) E. Dale, "Selection Of Classroom Motion Picture," National Education Association Journal, 20:307-8, November, 1931.

The primary purpose of a classroom film is to instruct and not to entertain.

The distinctive function of the classroom motion picture is the portrayal of objects or events whose essential meaning is best understood when they are seen in motion.

The still picture is static; it shows products or results.

The motion picture is dynamic; it shows processes, developments, and change. It, alone, can portray motion. The still picture can only suggest action.

The action material presented should be relatively unfamili-
ar to the child and of such a nature that it cannot be taught more
effectively by first-hand contact with the object or event. Provi-
sion should be made for individual differences by grading in res-
pect to length, nature and difficulty of material taught.

Skilful titling is absolutely essential in good classroom
motion pictures.

The film should present unmistakable evidence of excellent
photography.

The general organization of the film should be such that it
tells the essential story in a simple, unified, coherent manner.

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(37) A. J. Stoddard, "Talking Pictures In Education," American
School Board Journal, 93:256, July, 1936.

The motion picture represented a large step forward because it
made possible the presentation of the continuity of processes and
events, and the sequence of relationship. But the sound picture
represented the greates step forward in this long conquest of the
limitations to learning. It brough a nearer approach to reality
in the transmission of concepts by combining an appeal simultan-
eously to the senses of both sight and hearing. Even more impor-
tant, from the standpoint of teaching and learning, it made possi-
ble the accurate and efficient integration of the voice of inter-
pretation with the elements of the pictures.

The educator is on the lookout for every medium that will help

to introduce more of reality into learning situations.

The educational sound picture is a marvelous extension of the function of the eye and ear.

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(38) Newton Edwards, "Instructional Value of Sound Motion Pictures,"
Elementary School Journal, 32:4-6, September, 1931.

The state superintendents of education of each state selected two children of suitable age and mental ability to go to Washington to participate in a test given by the Fox Film Corporation. Five pictures were shown of from one to four reels each.

Children were given tests before seeing the sound films, and immediately following the picture the same test was repeated. Some of the findings of the committee on this test, which was given to 50 boys and to 47 girls, were:

1. On the first test the boys surpasses; on the second test the girls surpassed on one of the tests.

2. The boys and girls made the same average gains in three of the tests.

3. On the final test all the boys and girls made an average gain of more than 88 points on all five tests.

The Terman Group Test of Mental Ability, examination form A-, was given to all children. Intelligence Quotients for boys ranged from 94 to 158; for girls, from 87 to 137; the average gain was five per cent.

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(39) E. I. Way, "Motion Pictures In The Schools," Elementary School
      Journal, 17:5-6, November, 1931.

The subject in which motion picture films play the greatest part
is social science. Next comes natural science, with physical edu-
cation, manual and industrial arts, home economics, english and com-
mercial subjects following in order. For extra-curricular purposes
films in the natural sciences show the greatest popularity.

In a tabulation showing the number of films in various sub-
jects which were considered the most adaptable to school use and
therefore the most satisfactory for teaching purposes, it was found
that science, geography, commercial subjects, history and health
accounted for more than 80 per cent of the film titles repeated.

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(40) J. E. Hansen, "Verbal Accompaniment of the Educational Film--
      The Recorded Voice Vs. The Voice of the Classroom Teacher,"
      Journal of Experimental Education, 5:1-6, September, 1936.

Sound motion pictures fall into two classes:

1. The bona-fide sound picture, in which natural sound is re-
corded and reproduced as an essential element of that which is por-
trayed.

2. The strictly talking picture, which has been photographed
as a silent picture and to which has been added merely and inciden-
tally an explanatory lecture.

In a study made of the efficiency of the use of the latter

method as compared to a lecture given by teachers with a silent picture, it was found that the verbal explanation accompanying an educational picture of the talking picture type can be presented as effectively by the classroom teacher as by the medium of the recorded voice and the sound motion picture projector.

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/ (41) E. D. Jayne, "Integrated Versus The Non-integrated Use Of Moving Pictures In The Classroom," Journal of Experimental Education, 5:7-16, September, 1936.

This investigation is relative to the teaching value of two commonly used, fundamentally different, methods of using educational films in the classroom. In one method a film is used incidentally, sometimes before or after the teaching of the unit to which it pertains. This is the non-integrated method. In the Second method, a film is used at the time the unit of work to which it pertains is being taught in such a manner that the film becomes an integral part of the teaching unit.

Conclusion: Children learn much more from a film when it is integrated with a unit of work. Children learn more from a unit of work when a film is integrated with it.

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\ (42) B. D. Wood, "What Is The Potential Value of Teaching Films?" Nation's Schools, 3:54-60, March, 1929.

It has long been recognized that motion pictures make definite

and unique contributions to education, such as, for example, presenting precise ideas of dynamic relations and motion studies. In general, they present a sense of the concrete existence of places and objects that otherwise remain for most children largely tasteless words or flat and lifeless still pictures.

Classroom films increase the rate and quality of learning; they arouse interests, stimulate the use of books and libraries, improve the English composition of children, and in general improve their thinking habits.

The experiment shows that better work was accomplished by pupils taught by films than by those in the control class where no motion pictures were used.

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(43) R. E. Rose, "Chemistry Of Motion Picture Film," School Science And Mathematics, 29:206, February, 1929.

At first, little specks of silver bromide were put on glass plates; they had to be on something transparent and glass was the only transparent substance available. It was possible to make records with photography at this stage of its development but the moving picture was out of the question.

Then came the discovery that cotton could be made into nitrocellulose, that nitrocellulose could be dissolved in alcohol and that when the solution was mixed with camphor a transparent plastic was formed. This transparent plastic was flexible, glass was not. This difference made the modern motion picture possible. Fortunately,

it happens that silver is very permanent material, and so are gelatin and the transparent plastic if properly kept, so that we may look forward to very permanent records in silver of the doings of humanity. The amount of silver used for this purpose is very remarkable; the leading photographic company in this country uses tons of silver, this use coming next in importance to the government's coinage of silver.

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(44) C. A. Gramet, "Non-commercial Teaching Film," Progressive Education, 13:454, October, 1936.

In every school, there are specific and local situations that should be pictured but which cannot be produced commercially at a profit. By making such films, we, as teachers, can objectify our principles and develop a sounder psychology. The old idea of learning by doing is still good. It applies to teachers as well as pupils and participating in making picture does increase the effectiveness of using them.

A sixteen millimeter camera is, to-day, a simple and efficient mechanism. Many teachers own and use these cameras. Why not direct them at school situations? It's great fun and satisfaction to combine educational, avocational interests with educational, vocational ones.

It is as easy to make good pictures as poor ones. The same camera, operator, and situation are motivated only a little more thought and study in preparation are needed.

Study the techniques used in professional motion pictures.
Note how smoothly the continuity of action is maintained; how ef-
fectively closeups are used to focus attention; how the interest is
developed and sustained; how the scenes are timed so that they are
short enough to be interesting and long enough to cover the subject.
Give special thought to the title. Leave something to the imagina-
tion or provoke though suggestions. Spending money for this is spen-
ding money for education and enjoyment; such a practice should be
encouraged.

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(45) J. Marshall, "Sound Film In Education," American School Board
      Journal, 91:29-30, June, 1935.

The sound picture has at its disposal in numerous desirable
combinations, the inherent advantages of the telescope, the micro-
scope, the motion-picture camera (with its many devices, such as
slow motion, time-lapse photography, and animation), and sound re-
cording and amplifying devices. Clarification of concepts through
this medium is not necessarily dependent upon the "tool subjects"
of the curriculum.

The educational picture must, above all, be authentic. Fur-
thermore, the film not only must be integrated with lesson plans
and effective teaching procedures, but it must perform services
which cannot be performed efficiently by the classroom teacher wor-
king under ordinary conditions. These requirements call for a def-
inite plan of production by which the producer of educational talk-

ing pictures must be guided. This procedure, followed in the preparation of a typical unit, is outlined below.

1. A statement of the educational objectives of the unit.

2. A suggested overview of the unit for the teachers' use.

3. Numerous suggestions to be used in the approach to the study of the unit.

4. A comprehensive summary of the subject matter covered in the unit.

5. A suggested list of individual students' activities during the study of the unit.

6. Numerous references for the teacher.

7. References for the use of the student.

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(46) G. A. Gould, "Classroom Films," School Science and Mathematics, 31:870-1, October, 1931.

For many years, educators have realized the almost unlimited possibilities of the motion picture for teaching purposes. However, the available equipment had heretofore been expensive, and there had been hardly any picture material prepared especially for teaching.

With the advent of the 16mm. camera and non-inflammable motion picture film, the present-day classroom film became possible. The initial cost was vastly lower, both for projectors and films. There were no restrictions against its use, no increase in insurance rates, because the film was non-inflammable.

If a school owns their own films, they are available whenever

you need them, for as long as you need them, and as many times as you wish to show them.

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(47) F. M. Warrell, "Sound-on-film Projectors And The School Program," American School Board Journal, 93:48, July, 1936.

Although as much discrimination as possible was used in selecting films, experience showed that the silent films are, for the most part, not specifically designed for teaching purposes. The titles are often misleading. The contents are not built around a well-defined central theme. Facts are presented with little though as to the proper psychological order. Captions are few and the important points are seldom emphasized.

The sound films are organized around a central problem and the contents are presented in a logical, clear manner. The monologue is developed by master teachers and due emphasis placed where most needed.

The sound film is invaluable in the teaching of music appreciation or similar studies. It is also a source of revenue and entertainment to the school.

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(48) J. O. Frank, "Experiment In Visual Education," Journal of Chemical Education, 10:90-1, February, 1933.

The following are tentative conclusions reached after question-

ing forty students:

1. Give a set of slides, then give a complete lecture.

2. Give a complete set of slides covering a unit rather than a few slides covering some items.

3. Sets of slides sometimes become obsolete for certain subjects.

4. Students prefer charts and diagrams to tables, also tabular form rather than story form.

5. Slides carrying printed captions and printed notations.

6. Bold-face type in captions is more legible on slides.

7. The important advantage of slides is that time enough can given so that the slides can be mastered by the pupil.

8. For some subjects and designs charts are preferred to slides.

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(49) R. Bonar, "Cellophane Roll Films For Slide Lantern," Journal of Chemical Education, 10:92-4, February, 1933.

A cellophane roll film of standard width for slide lanterns may be quickly made from thin commercial wrapping cellophane by the use of carbon paper typing or by pen drawings. A roll of cellophane of 0.001 inch thickness and 400 inches long, wound on a 3/16 inch core is less than 3/4 inch in diameter. Such a roll is equivalent to 120 slides, with a capacity for at least 8,000 words, yet weighs less than one glass slide. These rolls are inserted in and operated by an easily constructed roll carrier which fits into the open-

ing occupied by the slide carrier of the ordinary lantern.

Carbon paper impressions on cellophane smear easily. Such typing may be made more permanent by passing the typed film through a suitable liquid, such as ethyl acetate, followed by blotting and drying.

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(50) A. Heine, "Talking Slide-films For Visual Education Purposes," Education, 55:94-7, October, 1934.

The talking slide-film is an inexpensive and simple talking picture projected on the screen from 35 millimeter professional strip film of still pictures. The voice and sound effects are reproduced by an electric high-frequency device employing transcription discs simultaneously with the exposure of the slide film frames. The entire equipment consising of projector and sound reproducer is properly housed in a light, sturdy and portable case. The amplifier and loud speaker are parts of the apparatus, which is very simple. Frames may be held longer for observation than the exposure of ten seconds usually consumed. Frames and voice may be tuned back for repetition. They furnish all the advantages of simple glass and slide films and stereographs with many additional and valuable features.

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(51) H. W. Pike, "Miniature Lantern Slides," American Photography, 31:398-99, June, 1937.

One of the most interesting, even spectacular, uses of miniature camera negatives is for making miniature glass lantern slides. Anyone who has had a miniature slide "blown up" to three or four feet on a screen knows that the projected image holds as much additional interest as a big enlargement in comparison with a tiny print.

Until fairly recently, emphasis on small positives for projection was in the direction of so-called strip films, or film slides.

In making a slide, use glass 3 5/16 x 4 1/16 inches; the printing process follows the general method used in making prints on paper. However, since lantern plates are much faster, it is necessary to work with a darkroom light which is safe for very fast enlarging papers. For printing, the writer has found that a yellow bulb which is satisfactory for developing ordinary contact prints is fast enough for printing lantern slides.

Glass protection should be placed on both sides of the slide and bound together with binding tape.

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(52) C. E. Dent, "Teaching By Means of Stereographs and Slides," Nation's School, 13:60-7, June, 1934.

The third-dimensional effect of the stereograph makes a strong impression in the classroom pupil's mind, and gives charm and educational value to the picture, as it creates an illusion of reality and solidity which seems to transport him actually into the pictured situation.

The low cost of the stereograph is one of its chief advantages.

Stereoscopes, through which the third-dimensional effect is secured, are likewise inexpensive.

Just as the stereograph is highly effective for individual instruction, the glass slide serves equally well for group instruction. The slide remains the most useful projected still picture, giving accurate reproduction and clear projection under all ordinary conditions. The pupil-made slide is a powerful motivating force.

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(53) H. F. Hughes, "Enlargement by Projection," School Arts Magazine, 36:51-3, September, 1936.

The enlarging of pictures and maps on the blackboard, wall paper or cloth by the means of the projector is very useful, especially for art purposes. The pupils are given the experience in color mixing and design. Large pictures may be broken up into sections and therefore flashed on the screen. As these slides that are used are never larger than 4 x 6 inches, the sections may be matched on an entire picture, then studied under the enlargement. A more detailed study is possible than under any other method.

The outline of these pictures, when flashed on the desired wall or paper, may be drawn or painted in this giving an enlargement of a desired picture to be used in an art project in mural painting.

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(54) D. C. Doane, "What Makes a Good Educational Film," Education-
al Screen, 15:203-206, September, 1936.

This article presents a summary of conclusions reached by an
analysis of 63 experimental investigations concerning educational
motion pictures. The findings of these investigations may be sum-
marized as follows:

Desirable characteristics of educational motion pictures:

1. Correlation with an integration into the usual course of
   study for the subject and grade intended. This is at once
   the most important and most commonly ignored.

2. Limitation to presentation of facts.

3. Provision for future activity; challenging future thought.

4. The best possible degree of technical perfection.

5. In general limiting the length to one reel at most.

Undesirable characteristics:

1. Presentation of material which can be presented otherwise,
   either by an identical demonstration or equally effective
   in another way. Motion pictures are expensive, and there
   is apparently no intrinsic value in the moving picture it-
   self.

2. Material familiar to the pupils for which the film is in-
   tended. Let the teacher refer to it instead.

3. Aims to create attitudes or to influence behavior, or
   presentation of general ideas.

4. An excess of maps, tables, and non-moving diagrams.

5. An excess of titles or pictures not involving motion.

6. Teaching how to perform an activity (e.g., a laboratory experiment).

7. Sound accompaniment consisting of a lecture only.

Important questions not established:

1. Relative effectiveness of otherwise identical sound and silent films.

2. The grade in which the film is most effective. Tentatively, however, the best opening for the film appears to be in the secondary schools.

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(55) Emera L. Engel, "Opaque Projector In The Schoolroom," National Elementary School Principal, 13:330-5, June, 1934.

The opaque projector is designed to show on a screen prints, drawings, postcards, specimens and other non-transparent materials. The opaque projector with its daylight screen and wealth of available material admirably meets the classroom teacher's daily needs. It stands ready to introduce a new subject for study in an interesting way; it economizes time, since, through the eye, most children learn with greatest rapidity; it gives more accurate knowledge to children than word descriptions, due to their lack of experience and misunderstanding of words; it clarifies more quickly than long word expressions; and it is especially effective in summing up and reviewing a subject.

As the small pictures meet the child's individual need, so the same picture, projected, meets the group's need. That which served its purpose of the study period can be turned to use in the recitation or discussion.

Everyday sources of materials--- (a) books, (b) magazines, (c) sets of postcards, (d) original drawings, and (e) cartoons--- are used. Only pictures of good quality should be used. Colored pictures should be artistic and the composition authentic; if black and white, outlines should be clear and distinct. Also, the pictures should give accurate and true information. One advantage of the picture collection over the slide is that it can at small cost contain the very latest on any given subject.

The opaque projector has certain disadvantages--- it lacks the action of the motion picture and the sense of depth given by the stereograph. But every visual aid has its disadvantage as well as its advantage and each should be used where it is most effective. The advantages of opaque projecting are worthy of serious consideration. Its convenience of presentation under ordinary classroom conditions makes it a valuable tool, and the wealth of good material easily obtained for it assures accurate, up-to-date, pertinent means of instruction. It can be made to stimulate and to help children solve their problems, thereby advancing measurably their development.

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(56) Loren C. Spires, "The Preparation of Educational Film Strips," Educational Screen, 16:149-50, May, 1937.

In making these film strips the 16 millimeter motion picture was used. These strips may be projected with the ordinary class-room motion picture projector, if it is set for still projection. The simplest form of filming is used, using a 16 millimeter motion picture camera. In the preparation of the material to be filmed, the teacher should make a carefully written sequence of the drawings and explanatory titles to be used. Each title or drawing is then transferred to a separate white card or strip of paper for photographing. All drawings should be in black ribbon and a relatively new black ribbon should be used on the typewriter for printing the titles and explanatory legends. After printing, each card is numbered according to its place in the sequence and is then ready for filming. The actual filming should be done in bright sunlight.

After making the last exposure of the sequence, the camera is taken into the dark-room, lighted by the red lamp, and the film is cut just above the film gate. The exposed strip may then be removed and is ready for development.

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(57) H. O. Burdick, "Increasing the Use Of Film Strips," Education-
al Screen, 15:206-7, September, 1936.

For some reason, film slides have not increased in popularity as rapidly as many thought they would several years ago. But, be-cause of the cost and expense of lantern slides, film slides are being used with increasing frequency.

One of the chief objections to some of the film slide machines

adapted to project slides is the fact that the slots are not arranged for rapid and continuous projection of a series. Each slide must be pulled out before another can be inserted. Instead of running the whole roll through to show one or two frames, separate positives of desirable frames can be made and stapled between two still pieces of pressboard. When these miniature slides are numbered, appropriately titled and filed, it will be found that three of these occupy less space than one lantern slide and are lighter and much less fragile. The film slide device then becomes flexible.

The use of film slide projectors is dependent upon excellent film slide material. At present, the largest single source of film slide material on all subjects is the Society for Visual Education, Chicago, Illinois.

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(58) G. L. Hart, "Stereopticon and Its Use," <u>National Elementary School Principal</u>, 13:313-18, June, 1934.

The modern stereopticon is light, simple to operate, sturdy in construction, equipped with a powerful incandescent lamp and fine lens system, and is capable of projecting a clear, brilliant picture in any ordinary classroom. It is possible to adequately illustrate every subject in the curriculum by either photographic lantern slides, or microscopic slides. In many cases, it will be possible to utilize not only one kind of material, but many kinds, for each type serves as a new stimulus and assists in presenting additional material. A set of one type of slides may be used for a general

survey, another for motivation, a third for clarifying topics or illustrating student reports, a fourth for presenting factual material and graphs, and a fifth for a checkup or review. Thus, we see that these different types of materials do not conflict but instead each gives the teacher a new and different approach to the subject.

Children enjoy setting up the stereopticon and assisting the teacher in its operation. There is nothing intricate or complicated about the projector and the only repairs are the occasional replacing of a burned-out lamp. When one considers the many ways in which this projector can be used, it is truly an essential instructional tool that each school should possess.

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(59) J. B. MacHarg, "Miniature Camera Way of Visual Instruction," Educational Screen, 14:123-5, May, 1935.

The moving-picture and the talking picture for group instruction are the most effective of the visual teaching devices; but for most classroom teaching, certain considerations make advisable a first emphasis upon the use of still projection, which has the great advantage of each and quietness of operation, combined with simplicity and economy in the production of slide material.

The uses and merits of the standard stereopticon with glass slides, 3 1/2 x 4 inches, are well known almost everywhere. It stands unrivaled for public lectures where colored slides are desired and for some types of teaching, especially in the lower grades.

The greatest disadvantage of the glass slide is the difficulty

of its production. Simple and easy as is the process, it demands a copying camera and other apparatus, a darkroom and knowledge of its technique, together with an expenditure of time and money that few teachers can afford to assume.

The production of one's own slides is, however, an essential for thoroughly satisfactory visual teaching, and therein lies a satisfaction of certain activity and a sense of accomplishment which adds keen joy to teaching. It enables one, too, to show valuable pictures and educational devices with others.

With the set-up illustrated, using two 100 watt lamps, film 23, aperture f. 3.5 and an exposure of 1/20 second, uniformly good copies are almost certain.

The camera, projector, and accompanying devices, which I have described, have opened a new world of photography, one of its most important fields being that of visual instruction.

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The writer has included in this chapter twenty-five annotated articles referring to projected pictures, which have been selected from thirteen different magazines.

Educators are constantly on the lookout for new teaching media such as visual education, which will make their teaching more efficient; and they are using visual education in every kind of school. These articles have shown that the educators who wrote them observed that, with the use of projected pictures as visual aids to customary classroom procedure, both the quality and quantity of learn-

ing of all grades of pupils increased. The noted increase is particularly apparent in the use of projected pictures with retarded and mentally deficient pupils. These writers, among whom were well-known teachers and educators in many fields, noted the following general trends in the use of projected visual helps; First, schools are tending to expand and make more efficient their visual aid programs. Second, they are recognizing the necessity for separate departments of visual education or at least teachers who, if not trained to specialize in visual education, are trained to use it with regular school work. Third, the schools are making visual education a recognized, correlated part of their curriculum.

FURTHER READINGS

(1) H. E. Hicks, "Stereograph As a Visual Aid," Sierra Educational News, 28:25-6, October, 1932.

(2) L. E. Brown, "Lantern Slides and Films in the Classroom," Norman Instructor and Primary Plans, 39:43, October, 1930.

(3) W. P. MacLean, "Comparison of Colored and Uncolored Slides," Educational Screen, 9:196-9, September, 1930, 10:41-3, February, 1931.

(4) W. E. Morse, "Movies On The Move," Nation's Schools, 18:50, October, 1936.

(5) J. R. Harris, "Simple Micro-Projector," School Science and Mathematics, 34:532-3, May, 1934.

(6) J. Marshall, "Sound Film In Education," American School Board
     Journal, 91:29-30, July, 1935.

(7) E. I. Richards, "From Window Glass To Lantern Slides," Instruc-
     tor, 43:31, November, 1933.

(8) C. A. Richmond, "Educational Value of Talking Movie Pictures,"
     Journal of Chemical Education, 8:848-50, May, 1931.

(9) L. B. Tyson, "Some Observations on The Practical Value of Talk-
     ing Pictures in Visual Education," Educational Screen, 10:106-7,
     January, 1931.

(10) W. S. Green, "New Idea in Projecting Microscopic Slides,"
     Educational Screen, 12:217-18, October, 1933.

(11) E. J. Nally, jr., "Sound Film in Education," Educational
     Screen, 11:39-41, February, 1931.

(12) R. O. Welch, "Screen Pictures With A Flashlight For the
     School Room," School Arts Magazine, 33:318-20, January, 1934.

(13) W. F. Barr, "Types And Uses of Projectors," National Elemen-
     tary School Principal, 13:308-12, June, 1934.

CHAPTER V

THE EQUIPMENT OF A
VISUAL EDUCATION DEPARTMENT

1. Items of Equipment

2. Cost

3. Administration

4. Filing System

5. Care and Storage

This chapter presents some annotated facts from periodical literature concerning the equipment of visual education departments in the public schools. These facts will deal not only with the equipping of the department, but with its administration and operation.

Equipment, naturally, will vary with the size of the school system which the visual education department under consideration is expected to serve, with the purpose which the apparatus is expected to serve in the system's curriculum, and with the financial ability of the system. A large system of schools which maintains a separate visual education branch will need equipment which covers every kind of projected and directly viewed picture, while for a smaller school, one slide projector or even a set of posters may suffice. According to the importance allotted them in the curriculum, too, visual education aids equipment will rise or fall in importance.

In equipping a school for the use of visual education helps in teaching, account must be taken of the kinds of visual education helps which are available and of their possibilities. These are

(1) Motion pictures, both silen and sound, (2) Lantern slides, (3) Film strips, (4) Stereoscopes and stereographs, (5) Directly viewed photographic prints or enlargements, (6) Sketches and posters, (7) Personal visits by the teacher and children to the project, process, or thing studied. The first four of these helps may be classified under "Projected Pictures". As the name suggests, three pieces of apparatus are required in the presentation of this class of visual aids. They are (1) the reproduction of the scene to be presented, (2) the projector, and (3) the screen, on which the projected image is thrown. These must be used by a capable operator, especially in the case of motion pictures, in order to secure the best results. Direct prints and posters may be displayed before the entire class and explained by a competent teacher, and may thus be of considerable value. Class visits to the scene of an industry or other point of interest, while they are the most direct method of presenting ex-planations and views of processes or points being taught, are not always practical to arrange. The foregoing methods of visual aids, then, substitute for the actual visit a visit 'by proxy' in which the viewer of the picture actually 'sees' the thing pictured and gains the same impression as if he had actually visited it himself.

The cost of the system is no longer an important item in the use of visual education. Although one can spend all the money one wants to on a visual education system, he can also secure the equip-ment he needs at a sum within the reach of the smallest budgets. If it is necessary to present, say, a very few lantern slides in the course of a year, a small magic lantern will be sufficient.

If a more extensive use is made of visual education aids, then a better projector and more incidental equipment will be necessary. Projectors may be secured, which, with the proper attachments, will project either slides, film strips, or moving pictures. Equipment, too, is so standardized that it may be added to or altered without extensive financial outlay or scrapping of equipment. Those schools which make only a partial use of visual education may rent films, slides, posters, or other items from the numerous film libraries situated in various parts of the country. The schools with more resources, which desire to maintain a library of visual aids of their own, may purchase films from these same libraries ready prepared or may make their own according to the object in sight. Those educators who desire to make their own classroom pictures will find either still or motion picture cameras in sizes and prices suiting their needs. A motion picture outfit comprising both 16 mm. camera and projector may be had without spending over $100, and still cameras are correspondingly reasonable in price. One company manufacturing miniature cameras offers a camera, printing enlarger, and strip projector for a total sum of around $50.00. And there are numerous other reasonably priced outfits which the teacher who wishes to make his own classroom pictures can purchase. There is, then, no need for any school to forego the advantages of visual education for financial reasons.

The next question which arises in equipping a school visual education system is, "How shall it be administered?" In a small school, one which does not use visual education sufficiently to jus-

tify a separate department, either the principal of the school or some teacher who is interested in visual education for his classes could be placed in charge of procuring, operating, and correlating the visual aids which are used. If a new system is being started, and none of the teachers available for visual education work has had previous experience in using it, two plans are possible. One of these is to have one teacher, who is designated for the purpose, take a course covering the use, operation, and care of visual education equipment of all kinds----- projector, movie film, slides, screen, etc. The other alternative is to secure all equipment and the operator from some outside source, so that all the teaching staff is concerned with is preparation for and presentation of the films or pictures shown. In any case, those who use and administer visual aids should understand clearly what they intend to gain by them, what material they are presenting in a film, and how to present and follow this material up. A film or even a single picture is valuable in itself, but with proper preparation of the student mind and with proper follow-up work in reading, theme-writing and other lines, its value increases another thousandfold. Teacher preparation devolves upon the teachers themselves in smaller schools; but in larger schools, having separate departments and separate, full time administrators of visual education, the administrator will do much of the preliminary work, and may even present the film himself, leaving the teacher to do only the preliminary and following class room work.

Proper storage of visual aid equipment is a vital part of the

visual education program of any school. Even if the school owns only one projector, a proper place in which to store it and the films used should be prepared. For this purpose, a table, the top of which serves as the base for the projector while it is in use, and the bottom of which bears builtin shelves for the projector and accessories and film racks or compartments for slides. It is well if such a table has a built in socket so that the projector may be plugged in without delay. For larger systems, which, of course, use more equipment and more films, a separate room or suite of rooms may be provided for the storage and repair of equipment. The details of such storage rooms, when properly built, are technical, and will not be discussed here. Any system of storage, however, should provide safe and convenient storage for all kinds of projectors and cameras used and for all sorts of films (inflammable and non-inflammable), as well as for their maintenance and repair.

Another essential of a well-run visual education department is the filing system, covering the equipment and films owned or loaned. The necessity and magnitude of such a system will vary with the size of the visual education department. Some form of information, however, should always be available on what equipment the department owns; on what material the department intends to rent from other sources and the time and term of rental; on what material the department is buying or intends to buy; and on material loaned out to other schools and the time and terms of such loans. A filing system for a visual education system, is, after all, merely a sort of 'bookkeeping' over the department, and should be practiced just as

religiously as if the commodities dealt in were real dollars and cents.

In summary then, a department of visual education should be equipped with the aims of the program, the size of the school, and its financial condition in mind. It should secure the best equipment possible and place it under the charge of one who thoroughly understands its use, care, and maintenance. The department should provide a proper place for storage of the equipment when not in use, and, if possible, a definite place for using them. The department should be so administered that the most efficient use is made of the available visual aids, and so that visual education helps are directly correlated with the course actually taught instead of being just 'shows'. The proper administration will include the maintenance of a proper filing system on the equipment it owns and leases. If we have a department of visual education which is well-equipped, well administered, and properly correlated with the curriculum of the schools, the standard of education will be raised. This is the constant aim of the educator.

The following articles from periodical literature, which cover all phases of the equipment of a department of visual education, have been selected and annotated to show modern practices in equipping model visual education departments.

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(60) Alvin B. Roberts, "Problems in Introducing a Visual Aid Program," Educational Screen, 16:179-181, June, 1937.

Perhaps the first problem which will confront the school exec-
utive is determining the type of projector to use. Roughly speak-
ing, projectors may be divided into two groups--- the still group,
including the lantern slide, opaque, film strip, and micro-projec-
tor; and the moving group, including the 35mm. and 16mm., either
silent or sound.

Building a suitable program requires considerable work over a
period of years; like building a curriculum, it is set up and chan-
ged from year to year. Starting from the ground up, the first prob-
lem is building a time schedule for the film which your department
is planning to use.

The greatest value will come to the class if the films are
properly fitted to the subject matter. As is true with all class
room procedure, a well-planned lesson secures far better results.

The student, too, must do some preparation for the film or
slides. In summarizing the main points to be considered in intro-
ducing a visual aid program, there are (1) selection of projector,
(2) interesting teachers in the project, (3) the time schedule,
(4) rating and supporting the film, (5) preparation of teachers,
(6) preparation of pupils, (7) holding pupils accountable for mate-
rial used.

See that too many films are not booked for the first year. To
get much better results, use fewer films allowing ample time for
preparation for both teacher and pupil.

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(61) E. C. Dent, "Time To Take Stock of Equipment for Visual Edu-
cation," Nation's Schools, 14:62-4, September, 1934.

The expert guidance available to schools which desire to make
effective use of visual aids to instruction have little excuse for
the repetition of past blunders. The universal acceptance of the
visual instruction idea should leave no question concerning the pos-
sible application of visual technique. The enormous quantity and
great variety of material available at low cost make it possible for
any progressive school to improve the educational opportunity offer-
ed its pupils. Schools and school systems which are not applying
these effective educational tools are becoming less in number each
year and should become obsolete in the very near future.

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(62) G. W. Wright, "Visual Aids at Little Cost," Journal of Educa-
tion, 116:201-214, April 7, 1933.

The visual equipment necessary--- a few school utensils, and
make use of the material at hand. First, the possibilities of the
rural school which does not have mechanical equipment available;
and second, the possibilities of the city school, which usually has.
The greatest opportunity the rural teacher has for visual emphasis
is that of the school trip. Here one sees Nature in her environ-
ment. The blending of the character of a boy or girl and the school
and outside life. The rural teacher and pupils may be found among
the flowers, the trees, the birds, and studying their various forms.

This purposeful procedure brings the child into closer contact with the country side of life.

The city teacher is not near to Nature. She may go to some winding stream, study birds, and collect rocks, flowers, leaves, and soil samples to take back to their school museum where they become a part of the school program. School journeys and trips will improve the instruction. It will increase initiative, develop the powers of observation, foster a keener interest in the out-of-doors and awaken an appreciation in agricultural pursuits, industries, and occupations.

Children need more picture experiences than those supplied by the text book alone. If the teacher will utilize such sources as geographical and illustrated magazines, pictorial sections in the daily and Sunday newspapers, and cuts and cartoons, she will greatly promote her educational program. The teacher should train her children to be ever alert to these agents of assistance. Another worth while step in the same direction is the institution of postal card collection and photographic album groups.

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(63) D. C. Knowlton, "Equipping For Visual Education," Junior-Senior High School Clearing House, 4:198-202, December, 1929.

The classroom teacher has found it impossible to ignore the 'movies' as they have tightened their hold upon the present generation. Visual instruction in general is one of the most effective means of realizing its mission.

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(64) E. Katz, "On The Cost of Instructional Films," <u>Progressive</u>
<u>Education</u>, 13:459, October, 1936.

Excellent teaching films can be had for as low as twenty dol-
lars per film. To be specific: a professor of fine arts at a
teachers' college wished to make a film. The actual production of
the film was done in one afternoon. The professor was the only ac-
tor, the filming took place in a five by ten foot office, lighting
was taken care of by twenty-five cent photoflood bulbs, and the
whole cost of the film was about fifteen dollars. This was exclu-
sive of the cost of the camera, tripods and lights, which were
parts of the permanent equipment of the fine arts department of the
college. Naturally, subjects which teachers may wish to film do
not all lend themselves to an inexpensive treatment. Certain top-
ics require the collaboration of experts, or more costly equipment,
but simple instructional films can easily and inexpensively be made
by the amateur.

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(65) S. D. Horning, "Programming in Visual Education," <u>Educational</u>
<u>Screen</u>, 11:303, September, 1932.

The essentials involved are: First, a definite course of study
in which visual aids have been assigned a definite place. Second,
a chairman, committee to make schedules. Third, a visual education
department, whether local, county, or state. Fourth, a corps of

visual educationally minded instructors is essential in order to
make out a satisfactory schedule. The success of visual education,
provided good material is available, rests very largely upon the
individual or committee who does the scheduling or programming, se-
cures material at the proper time, trains the operators and creates
a visually-minded teaching corps.

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(66) E. W. Crawford, "Director Guides Teachers In Use of Visual
Aids," Nation's Schools, 16:32-4, November, 1935.

The professional and personal relations between the teachers,
principals, directors and supervisors are of vital importance
in a supervisory program. The director is an administrator, super-
visor and teacher. Because her insight and sympathetic understand-
ing makes itself known, the teachers feel that she is a friend, a
person whose study, experience and time make possible her ability
to lead and cooperate. Because visual education is integrating in
character the aids contribute to all in the curriculum. Through
supervision the director helops the teachers in an understanding
of the modern trends in philosophy of education for aids are essen-
tial.

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(67) F. D. McClusky, "Administration of Visual Instruction in
Public Schools," Junior-Senior High School Clearing House,
5:207-14, December, 1930.

A study of development of organized visual education shows
three distinct phases. These are (1) school museum movements, (2)
university extension movements, (2) establishment of bureaus of vis-
ual education. The duties of the director are:

1. Know sources of new material.

2. Select wisely the material needed.

3. Interview teachers, principals, and others who are interes-
   ted in visual education.

4. Administer the routine of the department.

5. Follow up breakage and delays in transportation.

6. Supervise use of material.

7. Plan special exhibits.

8. Make tabular studies of use of material.

9. Make catalogues, lists, etc.

10. Prepare rules and regulations covering use of materials.

11. Preparation of lesson plans, lectures, digests to accom-
    pany slides.

12. Make report at stated intervals to his superiors.

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(68) H. H. Haworth, "Why, How, and Wherefore of Picture Education,"
      Nation's Schools, 10:17-22, December, 1932.

The visual education department of the Pasadena City Schools,
Pasadena, California, was officially organized during the summer
of 1927. Staff includes the principals and teachers, a clerk, pro-
jectionist, secretary, a teacher for cataloguing the library of vis-

ual aids, a photographer and colorist. It is the aim of the department to encourage a critical selection of visual material. Pictures are placed in five groups. (P) Prints, 8 x 10 inches or smaller are mounted on cards 10 x 12 inches. (SW) Small wall prints, 11 x 14 inches are mounted on cards 13 x 16 1/2 inches. (MW) Medium wall prints are mounted on cards 10 x 20 inches. (W) Wall prints, average 16 x 20 inches and are mounted on cards 22 x 28 inches. (F)Frieze; this is a horizontal picture approximately 15 x 39 inches.

The use of visual aids during the teaching process gives all the children of a large class the opportunity to create for themselves the same basic imagery of a new subject.

One of the cardinal principles in our philosophy of education is that visual aids must reach the classroom at the opportune time in the development of the lesson or they will lose much of their effectiveness. The majority of visual aids in the library are better adapted to the elementary grades. The conclusion that I draw from the study of the records is that approximately one-half of our teachers are, at the present time, making use of the facilities of the department.

There are three general methods for using visual aids; namely, for motivation, for reference, and for review.

The system of classification must be capable of almost unlimited expansion without being changed basically. It needs authoritative, detailed, reference works which can be used as guides and it should have an adequate yet fairly simple system of symbols to indicate the divisions. We have finally adapted the Dewey Decimal

Classification which is commonly used in libraries. Six of the
nine classifications were used--- (3) sociology, (5) pure science,
(6) useful arts, (7) fine arts, (8) literature, and (9) history.
Each class is similarly separated into nine divisions. Divisions
are similarly divided into nine sections. This process is repeated
as often as necessary.

Since there are several different types of visual aids and it
is a physical impossibility to file lantern slides and wall pic-
tures or prints and lantern slides together, we have arbitrarily
adopted the following letters as abbreviations to be used as pre-
fixes to the classification number:

E - exhibit   R - roll film

F - frieze   S - stereograph

L - lantern slide   SF - still film

MW - prints   SW - small wall print

W - wall print

In order to keep separate that part of our material which is suit-
able only for primary grades, the complete call number in a set is
prefixed by the letter (X). The number of pictures in a set is
written in parentheses, usually below the copy number.

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(69) J. V. Sullivan, "First Aid For Visual Aids," Nation's Schools,
      18:53-6, September, 1936.

To secure successful results in the visual instruction pro-
gram and to ensure longevity to the equipment, certain routine

procedure and practices should be strictly adhered to.

1. Do not allow inexperienced operators to practice on the machines unless they are carefully supervised.

2. Oil all equipment frequently and carefully.

3. Clean all parts of the machine through which the film passes with a bone scraper, and wipe these parts with a piece of cotton dampened with carbon tetrachloride.

4. Clean the reflector, bulb, condensers, and objective lens with a soft cloth or chamois.

The sound film presents additional difficulties and problems of operation and repairs. The sound track is very sensitive to dirt. Therefore, it is essential to keep all parts exceptionally clean. The tubes should be checked frequently for maximum efficiency and the sound head and speaker should be kept as free from dust as possible and should be covered when not in use.

When films are returned to the exchange for examination and repair, the condition of the container should be carefully checked, the name of the film should be placed on the container, and the film should be inspected and the humidor moistened if necessary.

In rewinding the film, a light should shine directly on the film. The examiner allows the film to pass through the fingers as he cautiously checks for oil on the film, dirt accumulations, burns and scorches. Practically all cleaners use as a base carbon tetrachloride. To splice a film properly a good heavy professional splicer should be used. To operate a projector successfully the person in charge should know the functions of its most important

parts. Screens seem to be the orphans of visual instruction equip-
ment. Likewise, they are seldom carefully selected.

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(70) M. A. Klein, "Filing System for Visual Aids," Educational
Screen, 12:103-44, 128-9, April and May, 1933.

The efficient functioning of a visual education division de-
pends greatly upon the proper set-up of the division and the proper
set-up in turn includes most decidedly an adequate filing system.
Practically all government departments and semi-official agencies
that distribute material use, with perhaps a few variations, the
system which I am going to describe and have found it very effic-
ient.

Visual education, or education by means of graphic presenta-
tion, is based on two fundamental principles, which are (1) ade-
quate information about all kinds of visual material, and (2) pro-
per distribution of visual material so that it may be used to the
best advantage and accounted for at all times.

In order to have all information in usable form and to pro-
perly conduct the distribution of visual material it is quite nec-
essary to have an adequate filing system, which should have at
least six separate files as follows:

1. The distribution file.

2. The stock file.

3. A temporary file for the shipper.

4. The card-information file.

5. The materials-information file.

6. The photographic file.

THE DISTRIBUTION FILE:

The purpose of the Distribution File is to provide an adequate record of the distribution of material and involves (1) a record of shipments so that they may be made at the proper time, (2) a means of locating material whether it is out on loan or in the stockroom, and (3) the complete history of all material distributed during the year.

The Distribution File should be divided by salmon-colored guide cards into five main divisions with the following designations on the tabs of the guide cards:

1. Send: must contain 31 blue guide cards to correspond to the days of the month. The "send" section is consulted each morning and the material scheduled for distribution on that date is prepared for shipment the first thing in the morning so that it will be ready when called for.

2. Tentative: sometimes the borrower does not understand the terms under which the material may be secured and it is necessary to make a tentative reservation until the doubt surrounding the loan is removed.

3. Future: takes care of all reservations not scheduled to go out during the current month.

4. Out: the shipping card is filed in this section. The acknowledgment form is filed in the office correspondence to show that the borrower received the shipment.

5. **Closed:** when material has been returned the shipping card
   if filed in this section indicates the year to which it be-
   longs.

THE STOCK FILE:

The purposes of the "Stock" file is to have an accurate re-
cord of all material available for distribution in connection with
the visual education work of the school system. The "Stock" file
will have as many main divisions as there are kinds of materials
and as many subdivisions as there are copies of films, sets of
slides, sets of posters, and individual pieces of material. The
main divisions usually found in a stock file are:

Film strips	Slides (glass)
Models	Posters
Machines	Motion pictures
Panels	(16mm. - 35mm.)

These captions should be noted on the tabs of the salmon-colored
guide cards that separate the main divisions. Each main division
is subdivided when necessary by blue guide cards.

The index card known as the stock card is a 4 x 6 white card
with a line across the top two spaces below the top of the card.
On the line three things are noted: (1) on the left-hand side is
stated the kind of material; (2) in the center is the purchase
date of the material, and (3) on the right-hand side is the number.

Two spaces below the first line is another line on which are
noted also three notations: (1) lent to; (2) date; (3) returned.

THE TEMPORARY FILE FOR THE SHIPPER:

A small shipping card is made for this file with just enough information on it to enable the shipping clerk to collect the material and to check it when the material is returned. Usually the name of the person to whom the material is being shipped and the list of material is sufficient.

THE INFORMATION FILES:

When information about visual material is received in your Visual Education department a notation is made on a small index card as to the name of the firm and the kind of material. This file is called the "Card-Information" file. The circulars, catalogues, etc., are filed in a regular size filing cabinet and this file is known as the "Information-Materials" files.

The main headings found in most card information files are as follows:

Artists	Novelties
Drama	Pageants
Film strips	Panels
machines	Posters
producers	Poster making
Glass slides	Publications (relating to
machines	visual education)
producers	Photographers
Lithographers	Printers
Machines (not projectors)	Programs
Maps	Sand table projects.

Mechanical equipment	Show cards
Motion Pictures	Showcard makers
Model makers	Stereographs
Models	Window displays

THE PHOTOGRAPHIC FILE:

Photographs are an important part of visual education. Photographs and negatives may both be kept in the same file. When a new picture is received, it should be catalogued and one copy mounted on a guide card with the title and index number at the top of the guide card. Extra copies of the photograph should be placed in a large envelope and the caption and index number noted on the side of the envelope. The title and index number are noted on all copies of the photograph and also the negative.

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(71) H. L. Kosser, "Suggestions on The Care Of 16mm. Film and Projectors," Educational Screen, 15:175, June, 1936.

Much of the damage to motion picture film may be eliminated through close attention to the film and projector. Most 16 mm. projectors are comparatively simple to operate, but this does not eliminate the necessity of careful training in the handling of both projector and film. Any motion picture projector needs attention.

The following suggestions may be of value in this connection. They are elementary to many, of course, but most film damage comes from neglect of just these elementary precautions.

1. The film is your responsibility while it is in your possesion.

2. Do not use the projector unless it is well cleaned, oiled, and in good condition for operation.

3. Before projecting any film, be sure to clean the aperture plate and shoes. As the film passes the aperture plate a certain amount of emulsion is scraped off. Sometimes the friction of the scale formed is so great that the sprocket holes of the film are torn by the intermittent movement trying to feed the films thus tightly held. Wipe the aperture plate and shoe with a chamois skin after the projection of each reel and clean with a bone scraper whenever an accumulation of emulsion is found adhering to them. Never scrape the metal parts with metal. This may cause damaging scratches.

4. Thread the projector carefully. Be sure that the loops are not lost at any time.

5. Never start the projector at a high rate of speed. This may result in a broken film or torn sprocket holes.

6. Go over the sprockets and guides once each week with a stiff brush and carbon tetrachloride to remove particles of dirt which gather between the teeth.

7. Do not use pins to join the ends of a broken film. Run a foot or so through the projector and lap the ends under the ends of the take-up reel, or use a small paper clip.

8. If necessary to splice a film, a good splicer should be

provided.

9. Do not rewind the film after the final showing before returning to the exchange.

10. Do not place moisture on the blotter in the humidor can if using borrowed films. This will be taken care of by the exchange.

11. Place the right band on the film after showing.

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(72) C. Hart, "Classroom Equipment For Motion Pictures Projection," Nation's Schools, 8:98, October, 1931.

When motion pictures are a regular part of a school program it is well to provide convenient storage, and equipment for easy and satisfactory projection. The projection machine should be in the rear of the rooms, so that pupils may remain in their regular seats. A movable table should hold the projector. The cabinet should be equipped to hold films not in use in the class. A roller silver screen permanently installed at the front of the room, beneath which the loudspeaker should be placed for best sound production. The use of opaque or semi-opaque windows shades would improve the quality of projection and lessen eye strain. A special storage room or storage space should be provided for projection equipment and films. Films should be stored in thermos cans. All racks should be well indexed. In larger schools the storage rooms should be of considerable size and may require a permanent attendant.

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This chapter presents thirteen annotated articles selected from five of the outstanding educational periodicals, which show the various things to consider in equipping the visual education department. Modern trends indicate that a visual education department should be equipped with the available budget, the desired objectives, and available material in mind. Educators now stress the most suitable and most related picture and equipment, rather than just any 'picture'. They say that visual education should be administered by those who have been trained for the work, and should be provided with the proper equipment and material to work with.

FURTHER READINGS

(1) W. D. Morgan, "Film Slides For Modern Visual Demands," Educational Screen, 9:265-9, November, 1930.

(2) N. L. Greene, "Museum and the Stereograph," Educational Screen, 13:35, February, 1934.

(3) J. F. Andrews, "Visual Program--- Its Equipment and Cost," Educational Screen, 13:93-5, April, 1934.

(4) J. G. Sigman, "Minimum Standard Equipment For Visual Education," Educational Screen, 9:43-4, February, 9:70-4, March, 1930.

(5) W. F. Kruse, "How One School Makes Its Own Teaching Films," Educational Screen, 10:109-10, April, 1931.

(6) E. A. Lathrop, "Government Agencies Supplying Visual Aids,"

National Elementary School Principal, 13:460-9, June, 1934.

(7) G. I. Dick, "New Opportunity For Librarians: Cataloguing Visual Aid Materials," _Library Journal_, 58:772-3, October, 1933.

(8) R. Gow, "Our Films," _Educational Screen_, 9:137-8, May, 1930.

(9) National Film Library, _School and Society_, 42:237-8, August, 1935.

(10) Film Library of the New York Museum of Modern Art, _School and Society_, 43:591, May, 1936.

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CHAPTER VI

THE PEDAGOGY OF VISUAL EDUCATION

In one or another of the preceding chapters, the possibilities and limitations of the various visual aids available to modern educators have been discussed. These visual aids have been separated into the various fields for purposes of discussion and analysis; and historical material has been given on the use of visual aids in education. But nowhere has mention been made yet of the pedagogy of visual education---- of why visual aids are helpful to the teacher in getting a message to the student, and how the teacher can make visual aids do this helpful work.

The pedagogy of visual education is, after all, at once a separate field of education and one allied directly with all other fields. Light is the first stimulus a young baby responds to, outside of the absolutely necessary life-sustaining sensations. As the baby grows older, this light forms itself into patterns of moving light and shadow, each one of which may be called a picture. It is through these countless pictures that the baby and young child learns as he grows older. The picture is the primary force, since the child learns all vital things from it. He learns to talk, to eat, and to do a thousand and one other things for himself by means of these pictures. Thus, the picture (the basis of all visual aids) is the primary and most important force in juvenile education. It has its place in the child's life before he enters school; and, when the child commences the first grade of school, he meets pictures in a new form. Here, they are directed toward his education.

When a child starts to school, he is taught his surroundings by means of pictures. He is taught his sums by the means of pictures. Who cannot remember his first days in school, when the teacher placed several objects on the table and taught the class to add, subtract, and to count. The student in school is confronted with many visual aids; but pictures themselves are not all. There are other means which have developed and can be used to good effect.

In considering the pedagogy of visual education, we must consider first, what the teacher's message to the pupil is, and second, how the teacher can most efficiently use visual aids to help convey this message. We may define the teacher's message, in general, as the knowledge which the teacher has and which is of proper level so that the pupil may assimilate it. The teacher's primary means of conveying this message is, of course, by personal contact. As secondary aids, the teacher has visual aids------ the blackboard, wall pictures and posters, illustrations in books, and projected pictures. It is how the teacher uses these secondary aids which will determine the effectiveness of her teaching.

Visual aids, which will constitute the majority of these secondary aids, may comprise as much or as little of the lesson which the student has to master as the teacher wishes. This much is true: that a picture, properly placed in the lesson, is worth many hours of verbal explanation. Everyone can remember instances in which a question he has asked has been answered by a sketch or picture placed before him by the person questioned, thus saving valuable minutes of time wasted in verbal explanation. And so it is in the

school. For instance, let us take a class in history. If the class
happens to be studying the Pilgrim Fathers, and the teacher mentions
Plymouth Rock, half the class will either not be sufficiently inter-
ested to note what is going on, or cannot understand. But let us
suppose that the teacher has a wall picture or a projector, and
shows the class a picture of Plymouth Rock. The class will then
see what the teacher is talking about. Although explanation, to be
sure, is not eliminated, the picture has helped the lesson along
immeasurably. If one picture can do this, why not use many pictures?
That is all right, if the pictures are chosen so as to have contin-
uity--- so as to tell a story. Modern visual education has several
ways of accomplishing this. One is to select a set of still pic-
tures or posters covering the lesson being studied, arranging them
in such order that they can be exhibited to the class one by one,
to illustrate the points of the lecture. These pictures may be in-
dividual wall pictures or posters; they may be separate frames of
a film strip; or they may be projected lantern slides. Another
method of telling a story is embodied in the modern silent or sound
motion picture. Here, instead of separate pictures being shown the
class, the pictures have continuity and (seemingly) move. The
motion picture eliminates the hesitation and gaps between separate
flat or projected pictures, and thus holds a higher percent of
classroom interest. All these kinds of pictures, however, have one
fault which has no means of remedy. That is, that they are incap-
able themselves of telling a story with the proper concept of time
lapse unless suitable explanation is made by an outside source.

When this fact is recognized and proper allowance made for it, the picture, whether flat or projected, still or moving, silent or accompanied by sound, has no peer in story-telling.

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Part I - THEORY

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(73) R. V. Bukhead, "World In The Classroom," Journal of Education, 117:190, April 2, 1934.

Education is less and less a factual process--- more and more an interpretative one. The business of interpreting life and right living to children falls on our shoulders. To do the job intelligently necessitates that each teacher, himself, should have a growing perspective of the world. We should see what the others are doing.

Fortunately, we don't have to break down sales resistance in getting visual material before old and young. It truly may be said that "All the world loves a picture". Pictorial sections in the daily newspapers are always good sellers. People go to the shows so that they may satisfy their desire to see life as others live it. Forman in his book, "Our Movie-Made Children", points out that 79 per cent of all talkies through certain periods dealth with sex, crime, and violence in general. This is because of interest in material.

Shop teachers, clubs and adult classes have joined in the

study of visual aids. They have worked with the camera clubs to produce good results.

Richard Patterson recently gave us a glimpse into the future when he forecast the wonders of television just around the corner.

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(74) K. Meola, "The Noon-Day Movies, Education's New Tool," National Education Association Proceedings, p. 721, 1935.

Noon-day movies are the motion pictures shown during the lunch periods in the school auditorium for recreational and educational purposes. They form a definite part of the curriculum because they solve administrative and housing problems.

Noon movie films are directly and indirectly connected with classroom instruction. Direct application is found in such courses as the 11A English course or a motion picture appreciation course, in which noon movies are the laboratory for the class discussion. Indirect connection with the classroom comes from the integration of the motion picture film in English, social science, natural science, oral English, dramatics, and skill subjects.

The wealth of material in classical and historical films furnishes sufficient reason why this new educational tool, through the media of the noon movies, should find a more definite place in the curriculum of the schools.

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(75) H. D. Kitson, "Teaching By Talkies," <u>Nation's Schools</u>,
    4:45-8, October, 1929.

The sound motion picture presents advantages over the old
silent types which are indisputable. As much as can be condensed
into one reel of sound film as formerly was required for three reels
of silent, at no more cost. Furthermore, voice and music and sound
effects are great forces in creating attention value. Also, the
sound picture is more realistic. Developments in the recording and
reproduction of sound motion pictures has been rapid and gratify-
ing.

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(76) F. B. Dutton, "Projection of Quiz Questions," <u>Journal Of
    Chemical Education</u>, 10:376, June, 1933.

In order to reduce to a minimum the cost and work of adminis-
tering and grading quizzes the questions have been typed on cello-
phane and projected on a screen through a film-strip projector. The
author uses chiefly true-false and multiple-choice questions. How-
ever, anything that may be typed, written, or drawn may be projec-
ted in this manner. A specially designed carrier is used to facil-
itate the rapid removal and filing of material for future use. The
cost of material for twenty-five questions does not exceed two cents.
The device aids the instructor in giving numbers of short quizzes,
thus discouraging the fine art of procrastination.

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(77) C. Stewart, "Preparation of Visual Tests," <u>School Science And Mathematics</u>, 33:523-5, May, 1933.

A great many commercial films, slides, and film slides are unfit for classroom use. They are primarily an advertising medium and ofttimes the material given in them does not fit in with the class work, is not available at the time it is needed, or is not organized and written up from the pedagogical point of view. These objections have caused unused visual material to fall into disfavor among some educators. A careful use of visual materials will pay large dividends in student motivation and learning.

To combat the entertainment idea that may have been formed regarding screened visual material, tests should be given on all material, the same as on the regular class work. Students should be urged to take notes on all materials. This promotes closer attention to details which might otherwise escape their notice.

One method is to project material on the screen. Tests from film slides can be placed on a mimeograph stencil with much the same method.

With lantern slides the diagrams are often large enough to be transferred directly to the mimeograph stencil without enlargement with the projector. This can be done by putting the slide up to a window with the stencil over it. Enough light will shine through so that one can trace the diagram. The whole test should be made largely objective, whenever possible, to simplify the marking of the papers. Tests should be carefully filed for future use.

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(78) D. R. Longmuir, "Educational Movies," Journal of Chemical
Education, 6:1017-18, June, 1929.

For convenience, we may arbitrarily divide educational moving
pictures into two classes. First come those prepared for general
use, but which may also be well adapted to classroom needs, and sec-
ondly, those devised primarily for classroom showing. As yet, the
available films of which we have personal knowledge seem to fall en-
tirely into the first class.

Already we are using films to a certain extent to demonstrate
practical applications of chemistry and chemical industrial pro-
cesses. The first main use which occurs to us is that it can be
made up to portray action which no human eye ever beheld at first
hand.

The teacher, or at least the film maker, can convey much more
clearly than he could by means of words, or with the aid of black-
board diagrams, a knowledge of events which he has never actually
seen save in his mind's eye. The army teaches the inner workings
of the machine gun and other arms in this way. The chemist can por-
tray the operation of primary, secondary, and electrolytic cells.
In short, the potentialities of the animated diagram are almost
unlimited.

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(79) Charles T. Dieffenback, "Student Activity In Visual Aid Pro-
gram," Educational Screen, 16:11-12, January, 1937.

A comprehensive program of visual instruction requires machines

for projection and reception, operators for said machines, and various administration measures to fit this type of work usefully into the school organization.

Boys and girls will gain in self-reliance, sportsmanship, and initiative as well as in resourcefullness. Pupils are taught how to become first class operators of the machinery. Every member of the club possesses a list of the essentials to be learned. A first class operator should know how to load a projector; to start the projector; to focus projector; to change speed; to rewind; to frame; to get projector; to repair film; to return to owner and how to use best available materials.

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(80) J. O. Malott, "Use Of Motion Pictures In Public Schools," School And Society, 35:171-2, February, 1932.

More than 60 per cent of the schools represented by approximately 6,000 principals and superintendents use motion picture films in some way for educational purposes.

Five out of six teachers using motion pictures for instruction state that they are not able to make a sufficiently detailed study of the film to get the maximum value from it. The inquiry shows, however, that motion pictures were reported by 95.9 per cent of the teachers as being helpful or very helpful in creating and holding an increased interest in school work and a sustained interest in topics studied.

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(81) C. F. Hoban, "Value Of Visual Aids In Instruction," American
      School Board Journal, 86:41, April, 1933.

Proper use of visual materials increases initial learning,
affects the economy of time in learning, increases the permanence of
learning, aids in teaching backward children, motivates learning by
increasing interest, voluntary reading and classroom participation.

All visual and sensory materials for teaching purposes can be
classified as (1) apparatus and equipment, (2) school journey or
field trips, (3) objects, models, or specimens, (4) pictorial mate-
rials, and (5) miscellaneous aids.

From the standpoint of enriching, vitalizing and improving the
quality of material and instruction, there are great possibilities
in the use of visual aids in teaching. The selection for the pre-
sentation of this material should be made with care.

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(82) O. S. Walters, "Industrial Motion Pictures in the Classroom,"
      Journal of Chemical Education, 6:1736-9, October, 1929.

With the increasing number of industrial films available on
different processes, and with their growing use as auxiliary aids
to the science course, the value of these films in the chemistry
classroom itself is of interest.

Titles used typical industrial films made by the larger com-
panies to illustrate their processes. These films carried a trans-
portation cost of about $1.50 per picture. Allowing fifteen minutes

to the reel, there was time for three pictures to be shown during
each class period. However, two reel pictures were more successful
because time was allowed immediately after showing for discussion.
Films were scheduled in advance for the series, and the questionnaire
was given to attempt to measure results.

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(83) M. M. Brine,"Visual Education In The Kindergarten," Educa-
tional Screen, 15:54, February, 1936

Visual education had its birth in the kindergartens. Froebel
wisely made sensory experiences one of the important factors in
child training. This method of exposing the child to these sen-
sory experiences has gradually spread through the school system and
to these have been added other visual aids, particularly the motion
picture and the lantern slide.

The kindergarten set the pace. It is not going to lay behind
but will continue to keep abreast with modern practices. The mo-
tion picture has already proved its value in the classroom. It is
to be regretted that, for the four and five year-old levels there
is very little film material. Here is a field yet unexploited, an
opportunity for educational films. The stereopticon on the other
hand, offers a wealth of material in the form of glass slides. The
slide is of great value in that large clear pictures can be studied
without eyestrain. One teacher has gathered and sorted slides so
that they are available in such groups as:

1. Activities of Childhood.

2. Birds.

3. Animals of the Farm.

4. Animals of the Zoo.

5. Transportation.

6. Children of Other Lands.

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(84) G. L. Freeman, "Visual Aids In Adult Education," <u>Educational</u>
<u>Screen</u>, 16:9-10, January, 1937.

Within the last few years, an ever-increasing number of adults
have come to participate as students in organized instructional sit-
uations. The university college is a night school and its classes
are open to people of all ages and degrees of educational maturity.

Finally, the adult student is likely to demand a very high
standard of instructional efficiency. Visual aids such as the mo-
tion picture and slide film seemed a natural solution of these prob-
lems. Books were read, visits made to commercial studios, and avail-
able educational films criticized.

To-day, we recognize that the forcing of products, trade names
and services upon the public by the shotgun method eventually defeats
its own ends. Furthermore, because the film is not cumbered with
unnecessary and irrelevant propaganda, etc., educational efficiency
and usefulness is enhanced and its circulation is correspondingly
increased.

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(85) J. Parnes, "Use Of Visual Aids In Special Class," Educational
      Screen, 10:76, March, 1931.

With visual aids the child actually sees the picture of the
thing he is talking about. It is startlingly realistic. This
realism gives a slow child confidence and the little success which
he attains in his first effort encourages him to talk freely on al-
most any topic or activity with which he has had any contact or ex-
perience. Furthermore, sub-normal children after several years of
retardation in the grades develop a suppression for oral expression;
here, again, we witness a triumph for visual education. Visual aids
offer the very best opportunities for freedom of speech, encourage-
ment of conversation and speech correction.

Children of low mentality need a great many impressions to help
clinch a thought. Study through pictures meets this need by calling
upon all the senses to help create impressions, and, moreover, since
several subjects may be discussed in the teaching of one slide, the
children can be taught to correlate their ideas.

Light arouses mental activity. The illuminated spot as made
by the picture machine serves as a collector of thoughts and keeps
the interest of the group focused on a given point.

Health education is a more important task in the special class,
and the teacher often finds it exceedingly difficult. Cleanliness
in body---- cleanliness of clothes--- proper regulation of hours for
play, hours for eating and sleeping must be taught.

The social attitude that is developed through a lesson with
pictures is most valuable to a sub-normal child, who is unadjusted

to his everyday surroundings.

The use of visual aids in education, whether confined to the special classes or conveying the entire field of educational endeavor, actually staggers the imagination. It seems to have no limitations.

'Education is life itself.' To what teaching device may we turn to better illustrate life, in its varied activities, than pictures..... whether lantern slides, still-films or movies?

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(86) J. S. Allen, "Films In The College Classroom," Educational Screen, 14:161, June, 1935.

The development of modern motion picture methods and the advent of talking films has increased the value of movies as a teaching device by several hundred percent. The fact that 'close-up' shots and 'telephoto' shots can be shown on one large screen eliminates the difficulties involved in having a class in a large room and indoors. Animated drawings and stop-motion photography are particularly useful in getting at the principle involved rather than making a show of the apparatus.

We have found a few talking films that cover some topics adequately enough for our purposes so that we need to take very little class time for these topics. When films are not available or are not adequate for our purposes we return to our former methods of lecture, demonstrated with apparatus and lantern slides.

It is hoped that more talking motion pictures that are modern

in subject matter and in technique will be developed for use by
college classes in science.

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(87) V. C. Arnspiger and M. R. Brunstetter, "Talking Pictures In
      The School Assembly," National Elementary School Principal,
      14:273-6, June, 1935.

The school assembly represents a comparatively undeveloped
field for educational effort. The program must be so arranged that
it makes contact with every pupil; it must make itself immediately
personal to him.

The sound film is both an individual and a group device. The
sound film may be utilized in assemblies which are directly concer-
ned with problems of character and citizenship. Another area in
which the talking picture can contribute significantly is in assem-
bly programs in the field of vocational education, assistance, and
guidance.

Another type of assembly program to which the talking picture
can contribute is that which aims to raise the cultural levels of
the children.

Another program worthwhile as a series of educational experi-
ences is one that has been carefully planned, first in terms of de-
sirable objectives and outcomes, and second in terms of the activ-
ities and materials which will accomplish these ends.

The chief responsibility of the school principal lies in de-
termining the social needs of his students so that any film program

organized will effectually meet those needs.

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(88) Frederick L. Devereaux, "Psychological Test To Determine The
Effectiveness of the Talking Picture," School and Society,
35:312, March, 1932.

Following the period of instruction, each of five groups will
be tested with the same questions covering the subject-matter in
which instruction was given. Comparison of the results achieved by
each group should indicate the measure of effectiveness of the talk-
ing picture as a medium of education.

Night pictures are being used in the experiment. A group of
research students from Columbia University, now receiving special
training for the work will score the test papers.

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(89) J. E. Hanson, "Why We Should Use Pictures In Teaching," Jun-
ior-Senior High School Clearing House, 5:204-7, December, 1930.

The more limited the intellectual capacity of pupils, the great-
er is the need for visual aids in their instruction. This is also
true for the pupils who lack experience.

When the possibilities of the picture, be it the photographs
or the screen picture--- still or moving--- are more fully realized
and exploited, then will all teachers realizing its value feel the
need of it.

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(90) W. W. Whittinghill and J. S. Thomas, "Interpreting the School
      With Visual Aids," Education, 55:341-6, February, 1935.

The increasing use of silent and sound motion pictures for in-
structional purposes is making more real and more understandable
many school subjects. They are helping to give a better interpre-
tation of social organization than ever before.

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(91) J. H. McNabb, "Visual Education," Educational Screen, 8:156,
      May, 1929.

We hardly have to seek our education now. It comes to us!
Mechanical inventions of the Twentieth Century not only bring us
learning, but bring it in such a way that we can easily digest it.
This must be so for a generation which literally runs while they
read. That explains why we must make use of these means of radio
and motion pictures, in order to improve our minds as well as to en-
tertain us.

Yale University, a symbol of all that is best in Education, has
sponsored series of films to be used in connection with the "book
teaching" of history. These are the chronicles of American Photo-
plays.

Johnny lives in historical yesterdays---- so vivid that he can't
forget them. This is the real reason for the educational success of
motion pictures.

Not only have leading educators added motion pictures to their

curricula, but they have also thrown open their schools to exper-
imental and research work, to determine the relative value of motion
pictures compared to oral instruction methods.

And what may they mean to children of the future? Do we yet
realize the marvelous use for movies in the home? Undoubtedly, our
public libraries were equally unforeseen in the world's first aston-
ishment at printed words.

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(92) J. A. Bollinger, "Use Of Stereographs And Stereopticon In
Classroom Teaching," National Education Association Proceed-
ings, p. 940-1, 1929.

Most of the stereographs and lantern slides available for school
use are photographs of actual objects or scenes. Only first-class
photography should be accepted.

The stereograph is primarily an individual aid---- one of the
most valuable visual aids when used in individual study or prepara-
tion. During the study period, definite study stereographs may be
assigned to individual pupils for study and later report. A corres-
ponding lantern slide maybe used in making the report. Lantern
slides are decidedly an advantageous thing in organized group pro-
cedure. The picture is projected on the screen where it challenges
the attention and stimulates the interest in every member of the
group. It aids in concentrating thought on the center of interest.
The main idea stands out and the subordinate ideas fall into their
respective places. Discussions and questions by the pupils are

stimulated. Ideas are cleared up and information is fixed.

Good teachers have discovered that visual aids (1) challenge attention and stimulate learning; (2) economize time and energy in learning; (3) aid in forming correct concepts; (4) cultivate observation and extend the vision; (5) aid in forming sympathetic concepts with the environment; (6) stimulate imagination, yet help to control it; (7) stimulate constructive and creative thinking; (8) aid in developing sppreciation of ethical, aesthetic, and technical values; (9) aid in developing appreciation of what progress has cost the human race.

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(93) E. E. Macy, "Training In Visual Education," School Executive, 54:206-7, March, 1935.

Are teachers properly trained to use visual aids intelligently?

In a recent investigation in Chicago, an average gain in achievement of 24 percent was shown as a direct result of the use of visual aids. The development of visual education is often hindered, however, by enthusiastic but unintelligent use of visual aids by teachers who are unfamiliar with the proper use of such equipment. Such misuse will not be of much benefit to the pupil When there are those teachers who do not even seem interested in vital aids and make no attempt to correlate them with classroom work, the damage is greater. The best results in visual education will be attained through an intelligent use of visual aids in the classroom and through the intelligent selection of the proper type of material.

Among the causes of difficulty for teachers are lack of train-
ing in music and dramatics, dearth of teaching materials, and train-
ing in passive rather than dynamic methods of organization. Teachers
who want to be successful and progressive should master a wide range
of visual aids, should use them naturally, let the individual pupils
select vital points, provide for reciprocal pupil effect, cultivate
an open mind, note uses of aids in other lines, and lead pupils to
note values of different kinds.

Some desirable topics for teacher training are the following:
field trips; diagrams; maps; display racks; scrapbooks; bulletin
boards; magazines; newspapers; constructions; collections; replicas;
models; relics; specimens; objects; statuary; phantoms; local
history; clubs; pageants; special days; dramatizations; pioneer
clubs; posters; charts; graphs; types of equipment; exhibits; car-
toons; congresses; libraries; blackboards; stereographs; chalk skill;
museums; motion-picture cameras; 16 mm. and 35 mm. projectors;
slides; film-slide and opaque projectors; micro-cinematography;
samples; sources of free materials; daylight projectors; screens;
film---silent, sound, and still; home-made slides--- cellophane,
types, glass, and film; mechanics of projection-- lenses, mirrors,
and electrical devices.

Progressive teachers should educate their administrators, school
boards, and others, to the need for teacher training in visual edu-
cation; administrators should educate teachers, pupils, and school
boards to the point where they will demand teacher training in vis-
ual education. Tax-payers should also require this system of train-

ing in the school systems.

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(94) J. V. Ankeney (Chairman),"Report Of Committee On Teacher Train-
      ing In Visual Instruction," Educational Screen, 5:489, October,
      1936.

Visual instruction is concerned with two well-defined problems;
(a) that dealing with the selection and construction of visual aids;
and (b) that dealing with correct or better methods of using aids.
The question of how these problems may be approached is controver-
sial. Should visual education be introduced in courses in other sub-
jects, such as geography education, history education, and the like,
with no additional staff but with the proper correlation with the
subject under consideration? Or should visual education be presen-
ted in a separate course, given by a specially-trained instructor?

The arguments for the latter view are: (1) Not all teachers
of special methods have had experience in training student teachers
in the use of visual aids. (2) Special methods courses are over-
crowded and leave little time for ample consideration of visual in-
struction. (3) Teachers in service are in need of supplementary
training for that subject. (4) Visual instruction needs one person
responsible for training in methods and materials, or little will
be accomplished. (5) Separate courses are temporarily justified to
develop an awareness of the need for visual aids properly used.

Skill in the use of visual aids may be developed by demonstra-
tion lessons given under actual teaching conditions to "set a pat-

tern," followed by a discussion as to why this procedure was used, and finally by practice teaching under supervision, using visual aids and follow-up discussion. This last step, involving actual participation, is most desirable; "reading about" or "talking about" the use of visual aids will not quickly modify practices of young, inexperienced teachers.

In-service teachers may be assisted by summer-session courses, such as a separate course in materials and methods; a special methods course, a teachers' institute, or round-table demonstration and discussion. Helping, also, is supervisory assistance whereby demonstrations and illustrated source lists and bibliographies are made available.

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Part II - SPECIAL SUBJECTS

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(95) E. I. Otto, "Motivation of English Through Films, Slides, And Pictures," Educational Screen, 14:39-41, February, 1935.

Among all the visual aids which we now possess, the primary advantage of the motion picture is that of the element of motion, or apparent life, which is added to the strictly pictorial element.

Pictures have various functional uses in instruction which vary according to the teaching situation. In the subject of English, they may be used to stimulate interest and bring definite facts before the pupils.

In the use of pictures, the following should be kept in mind:

(1) Simple pictures are better than complicated ones for teaching.

(2) Pictures that show action are best suited for English work.

(3) Color is to be preferred, especially for lower grades.

In introducing technical English in its simplest form, such as the statement, question, command, and exclamation, quotations and possessives, the use of large, attractive, and well-mounted pictures makes the otherwise unattractive work a real pleasure to the child. Children are always delighted when they hear that the work will be supplemented with a moving picture.

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(96) J. D. Walsh, "Visual Education In The English Class," Educational Screen, 12:24, January, 1933.

All high school subjects are alive with visual education possibilities. However, my particular field is English. Far too often English teachers stop at the dramatization station in their journey to visual education land. This depot is very good, but there are other stops which afford as much interest if we will travel them.

In the building of a vocabulary, objects lend invaluable aid to an alert instructor.

Recently, a chalk box served the purpose of making my sophomore class "see" the work "Dovetail". Carefulness and versatility on the part of the English teacher, grade or high school, will bring unique and practical objects for the class to use in word study, poetry, grammar, and composition.

Utilize the visual education method in your English classes.
Plan when you can; but be open-minded for every chance to improve
the lesson by switching to any thing that will cause these "seeing"
creatures called pupils to "see" what is being presented.

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(97) F. M. Gatto, "Experimental Studies On The Use of Visual Aids
In The Teaching of Geography," Elementary School Journal,
34:494-5, March, 1934.

Pittsburgh schools carried on two experiments in the use of
visual aids in the teaching of fifth-grade geography. The first ex-
periment seeks to discover the comparative effectiveness of instruc-
tion in geography when lantern slides, still films, and stereographs
are used as the only aids and when they are used in conjunction with
motion picture films.

The second is an attempt to determine the comparative effect-
iveness of instruction in geography when lantern slides, still
films, stereographs, motion picture films are used and when no vis-
ual aids at all are used.

From the results of these studies, it would appear that, inso-
far as the acquisition of information is concerned, the addition of
motion picture films to lantern slides, still films, and stereographs
increases learning by about 14.5 percent with the chances of a true
difference in favor of the group using motion pictures being 98 to
100. However, when all the visual aids enumerated are used, the
consequent increase of information is practically 23 percent greater

than the amount of information accruing in the balance of such aids.
This difference is statistically reliable and obtains when gains are
measured by an information test following the instructional period
immediately.

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(98) H. Rothfuss, "Visual Education Project On The Life of Abraham
Lincoln," Educational Screen, 10:8-10, January, 1931.

This article shows concretely the correlation that may be made
between slides, motion pictures, and the departments of Art, English,
History, and Shop, in teaching the subject of Lincoln.

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(99) G. D. Spangler, "Study of Greece; Ancient And Modern (Grade
6B) With Visual Aids," Educational Screen, 11:166-8, June,
1932.

The study of Greece in the sixth grade is problematic from
several standpoints. Anything ancient is likely to be engulfed in
boredom, so far as the child is concerned.

The inauguration of a proper background was accomplished en-
tirely through the use of visual aids. The benefits derived by
the workers from this study have been definite and many.

The following outline was used in the study of the course:

1. Objectives in the study of Greece.

    a. Definite problems.

2. Procedure followed in the study of Greece.

   a. Presentation of the still film, "Ancient and Modern Greece".

   b. Study of maps for location, geographic peculiarities, and relief aspects.

   c. Brief reports on the early religion.

   d. Different reports on Olympic Games, Boats and Chariots, Temples and Good Citizenship.

3. Outcomes from study of Greece.

4. Visual Aids utilized: wall prints, study prints, glass slides and still films.

5. Methods of using visual aids.

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(100) A. M. Goebel, "The Use of Pictures In The Teaching of Geography," School Science and Mathematics, 33:473-478, May, 1933.

Pictures are considered as basic material in the teaching of geography, hence their use should be woven into the subject matter. Pictures used in Geography studies, to be of greatest value, should show the relation of cultural to natural items. The chief objecive is to encourage the ability to read from pictures the significant cultural items and to explain in part their relation to the natural. An important cultural item in a picture of the average town in the wheat growing section is the grain elevator. This is related to the level land, fertile soil, and growing season of the plains, the latter items to be read into the picture rather than out of it.

When pictures are wisely selected in terms of the contributions they make they give much toward the mastery of geographic fields of thought. It is essential, however, that teachers recognize the limitations of pictures as a source of material and that they realize that not all understandings may be secured from them even though they be of high geographic quality.

The first stage in geographic picture reading ability is very largely a matter of recognition. Just as pictures make a definite contribution in motivating the introduction, so also do they make their contribution in reviewing work, when pupils enjoy acting as guides.

Pictures contribute a large item to visual instruction when their recognition is used in summarizing geographic units. Certain things can be definitely tested through picture reading; therefore pupils should be held responsible for interpreting them. Certain questions which appear repeatedly are easily developed through the use of multiple-choice or true-false devices.

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(101) M. Bishop, "Visualized Education In Appreciation of The Arts," National Educational Association Proceedings, p. 721-2, 1935.

It is believed that the stimulus to appreciation through the emotions is best received in large numbers. Emotions must be taught indirectly and not directly. The arts help the pupil to realize the emotion. Cultural leadership comes through imitation mostly and

not through the learning process.

So far as most people are objectively minded the place of the picture in art is first. Yet the objective in a picture may be only a means to an end and the feeling of the artist may be found in the composition or color design.

Rhythm plays as great a part in pictures as it does in music. A course that uses all three of the arts to develop the appreciation of the pupil must of necessity fill the mind of the pupil with things of beauty and must by reason of its nature tend to increase the imagination of the pupil. This in turn will help to produce a feeling of the "life abundant".

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(102) E. Perkins, "Drawing From Motion Pictures," Educational Screen, 10:105-7, April, 1931.

In drawing from motion pictures the results depend largely on the teacher, as inevitably as in the case of all visual aids. Some idea of the scope of how the films can be used is suggested by the following summary:

1. To focus attention.

2. To prove observation.

3. To make quick choice of essentials.

4. To gain the power of feeling and expressing motion.

5. To prove and improve memory.

6. To gain a standard in proportion.

7. To improve quality of line.

8. To demonstrate lack of information.

9. To remove fear of drawing in beginners.

10. To bring the living world into the classroom.

11. To advance the time when expression in line will be as common as in speech and in writing.

12. To force students to think for themselves.

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(103) A. M. Harley and L. A. Astell, "Encouragement of Music Ap - preciation Through Visual Aids," <u>Educational Screen</u>, 11:262-3 November, 1932.

The teacher of academic subjects, including music, who employs any objective presentation including pictorial reproduction or graphic representation, is making use of visual aids. The score and baton as well as the stereopticon slide and film are after all properly designated as visual aids. In the pictorial group are biographies in lantern slides with lecture manuscripts in some of the greatest composers. One excellent series has been edited by the staff of the Musical Courier of New York.

A series of one-reel films on Famous Music Masters represents a definite contribution for music appreciation. A study of the lives and works of the great composers are included in the series. The sociological principles underlying visual aids, like music itself, are sufficiently sound to transcend national life and the spoken language. Interesting applications for the idea of visual aids as a means of encouraging music appreciation are to be found.

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(104) H. L. Reed, "Sources and Uses Of The Visual Aids In Teaching
Of Biology," Educational Screen, 211:228-9, 264-6, October,
November, 1932.

If there be any one subject which it would be impossible to
teach properly without the use of visual aids it is the subject of
biology.

Generally, it is very interesting to the teacher to prepare
the material himself; and I also believe that the student enjoys
studying living material far better than stained mounts of such
things as Paramecia, Amacha, etc., because, after all, Biology is a
vital subject. In my opinion, the proper use of visual aids in the
biological laboratory will make every student a lover of the subject
of Biology.

Blackboard diagrams should be used continually to illustrate
structures and this is a matter for each individual teacher to de-
velop to the best of his or her own personal ability. Careful
labeling of diagrams should always be employed.

The use of the Micro-Projector is suggested because:

1. It is used to demonstrate material and show it to the stu-
dent so that he may be certain of the organisms or tissues.

2. It is an essential piece of apparatus if each student does
not have an individual compound microscope.

3. It stimulates interest in the subject and prevents despon-
dency of new students.

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(105) H. J. Stack, "Teaching Safety Through Visual Education," Educational Screen, 15:82-4, March, 1936.

There is no question but that to-day, one of the most pressing problems that lies before the American public is that of preventing automobile and other types of accidents.

Public and private schools likewise feel that this matter of safety education is a real responsibility that cannot be avoided. Here is where visual education, using motion pictures, lantern slides, posters and other visual lessons, comes into use. Just teaching children safety rules or slogans, singing safety songs and giving negative lessons, will not be sufficient; but lantern slides with story lessons and motion pictures followed by check tests and discussion will have real value.

Over 13,000 colored lantern slides have been prepared for the use of schools and their educational agencies. Lantern slides are usually shown in the classroom. Posters are used very effectively. The following things should be kept in mind in teaching safety:

1. Lantern slides and film strip.

    a. Pictures used and activities shown should fit the grade level in which they are to be used.

    b. Photographs of children's activities have more interest than poster slides.

    c. Slides should be used seasonally, stressing the kind of safety most important during that month.

2. Motion Pictures.

    a. The scenarios shall be prepared by educators. If the schools are to use the material it must be sound.

    b. The film should fit the age of the children for which it is to be used.

    c. Standard quality of titles should be used to fit the reading vocabulary of children.

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(106) A. W. Reitze, "Visual Aids In Safety Education," Industrial Arts and Vocational Education, 23:272-4, September, 1934.

The term "visual aids" may be considered as such teaching devices which are primarily based on the sense of vision for their effectiveness. They include motion pictures, lantern slide, posters, photographs, cartoons, and dramatic presentations.

That these visual aids for the teaching of safety have value, is demonstrated by the facts that industry, which is largely interested in the economic value of a method, has so wholeheartedly adopted them in its safety campaign.

Thousands of safety posters are in daily use in practically every industry. A number of motion picture films have been made solely for the purpose of teaching safety to the employees in industrial plants. In addition, many factories have set up safety museums where safety devices are shown and demonstrated.

Schools have been slow to follow industry in the attempt to teach this most vital subject.

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(107) L. A. Williams, "Value Of Visual-Sensory Aids In Industrial
Education," National Educational Association Proceedings,
p. 793-4, 1932.

The first work required of those entering this field of visual
instruction is a course in industrial activities for elementary
schools. A study of primitive and modern industrial life offers a
background to measure the development of the five arts and how they
may be fitted to school work in a sane manner.

Briefly stated, first, we visualize with the use of words the
things we wish to illustrate or make. Second, we make the sketches
of the things we picture in our mind. Third, we gather materials and
construct our idea. After finishing all the work of the three cour-
ses described above the student takes up a study of visual aids in
teaching. The work covers seeing, searching, and selecting; pencil
sketching; chalk drawing; model making; cameras; projectors; plan-
ning observational lessons; teaching from pictures and models and
planning exhibits; and creating and using a museum.

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(108) A. P. Twogood and R. Cramlet, "Visual Aids in Mechanical Draw-
ings For Beginners," Educational Screen, 8:261-2, November,
1929.

The day of the large school class has arrived to stay, and every
teacher is confronted with the problem of handling his classes ef-

fectively in spite of increased numbers, The book is more difficult when the subject is entirely new to the class.

After a survey of various teaching aids or devices we decided upon the use of film slides and a daylight screen. In this course we have two primary objectives in mind: (1) To teach the principles involved in making two and three view working drawings, and (2) To prepare our pupils to read intelligently the drawings which form the basis of all our courses after the seven B grade. Our secondary objectives are (1) to teach a definite procedure applicable to any problem, and (2) through carefully controlled practise to establish habits in drawing which are at once sound and correct.

Throughout this film there is an abundance of repitition which is fundamental to the learning process. Since we have used this film there has been an increase in both quality and quantity of drawings. A tremendous increase in enthuziasm and interest in the subject of mechanical drawing, and a great decrease in the number of failures also appeared.

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(109) D. K. Lewis, "Visual Aids In Science Teaching," Educational Screen, 14:67-71, March, 1935.

With the teaching of science in mind the writer experimented for a decade with different visual aid teaching set-ups; and now, after careful analysis of the results, feels completely justified in offering the unit attack method.

The actual unit investigation process follows a set routine of

six steps presented as follows:

a. Pre-test: an objective type test definitely covering the min-imum essentials introduces the unit.

b. Study outline presentation: definite questions and study di-rections are written in outline on the blackboard.

c. Study-investigation: various teaching aids are made acces-sible in the classroom, e. g., supplementary texts, etc.

d. Organization and checking information: this is usually a paper in story outline with the pupils' findings.

e. End Test: this includes a complete summary of all informa-tion gained over this unit.

f. Concluding Discussion: this is a very informal discussion wherein all final conclusions are considered.

The approach to learning is considered through the different aids such as (1) the school journey (2) educational museum, (3) stereographs, (4) photographs and prints, (5) projected pictures.

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(110) L. C. Hinchley, "Evaluation of Motion Picture Film For Class-
room Use In Biology," Educational Screen, 15:8-9, January,
1936.

In an attempt to determine whether the motion picture is like-ly to give pupils wrong ideas of biological concepts, five films were shown to a biology class of 25 sophomores and juniors. Before the picture tests were given which included 22 questions.

From the questions given after the showing it may be conclu-

ded that useful information may be obtained by high school pupils
from one presentation of a film if the pictures are clear and dis-
tinct and the accompanying sub-titles are simple and direct; that
misconceptions are likely to arise in the minds of the pupils if the
photography is poor or if the sub-titles are involved and technical;
and that time relationships cannot be clearly shown in the film un-
less the action is accompanied by a suitable explanation.

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(111) W. Perry, "Biology Teaching and Visual Aids," National Edu-

cational Association Proceedings, p. 565, 1931.

Biology has an important contribution to make to the education
of a twentieth century youth in a twentieth century world.

Teachers of biology have employed aids since the day the botany
or zoology instructor brought a specimen into the classroom to il-
lustrate the lecture of the day. To-day we use them with a new con-
sciousness of their value in teaching; we give them an emphasis
which we formerly accorded only to demonstrations and experiments.

Teachers are realizing they are not training their pupils for
college science courses but for living.

The layman usually thinks of visual education in terms of pro-
jected pictures----- movies, slides, still-films and film slides.
The biology teacher makes use of these teahhing aids and in addition
is dependent upon the real life or the exhibit material usually
found in a school museum, flat pictures, charts, and models.

These new materials are indispensable in unfolding the story

of modern science.

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(112) Robert F. Collier, jr., "How To Prepare And Present A Science
Night Program," American Education Association Proceedings,
p. 722, 1935.

One of the most effective ways in which criticism of modern
education can be met is by the all-inclusive, open-house program of
"science night".

To be successful, such an understanding demands the cooperation
of all teachers and students. It requires definite organization and
definite newspaper publicity.

Special features obtained from outside the school furnish in-
terest to the exhibit.

A "science night", therefore, requires organization, cooperation,
and lots of hard work. It has a definite educational value for the
students participating, and has the additional value of selling the
school to the taxpayers. With proper determination, any school can
put on a science night.

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(113) R. K. Watkins, "Learning Value of Some Motion Pictures In
High School Physics and General Science As An Illustration
Of A Simplified Technique in Educational Experimentation,"
Educational Screen, 10:135-37, May, 1931.

The result has been that we have sometimes failed to see the

woods for the trees. We have neglected the center of investigation. In our delight over a new tool we have forgotten what we started to do with the tool.

We have failed to describe the things compared. Is an automobile a better means of transportation than a horse? You assume that everyone understands horse and automobile. To determine the accuracy of this research experimentation six films were used and the results listed as follows.

1. Temperature Control.

2. Magnetism.

3. How We See.

4. The Magic of Communication.

5. Wizards of Wireless.

6. Revelations of the X-Ray.

The tests used were homemade objective tests based upon the facts and ideas contained in the film used.

Film	Maximum Score	Mean Initial Score	Mean Final Score	% Gain	% Gain
1.	36	23.37	35.25	11.88	50
2.	31	13.73	25.26	11.53	78
3.	40	27.26	35.00	7.74	28
4.	47	16.43	34.00	17.37	106
5.	40	16.62	22.50	5.88	37
6.	20	8.73	16.33	7.60	87

The pupils in the physics class show a rather interesting percent of gain, 28 to 106 as a result of watching moving picture in-

struction, presented by visual aids, in science simplified technique.

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(114) B. S. Hopkins and H. C. Dawson, "Experiment In Visual Educa-
tion In Elementary College Chemistry," School Science and
Mathematics, 32:253-63, April, 1932.

In the realm of educational films a much better situation ex-
ists. There is a considerable list of science subjects, and these
films are arranged for their educational value. Typical scenes
from the best sources may be obtained.

First, the list of offerings should be materially extended,
because at present there are many of the most important topics in
general chemistry which are not represented. It is probable that
developments along this line will be very gradual, at least so far
as the immediate future is concerned.

The films which are now available have been prepared for pup-
ils in geography, nature study or general science. We need a series
of films which have been assembled especially for the use of chem-
istry students, which use chemical terms and emphasize the chemistry
involved.

A greater use of animated diagrams is needed. In a chemical
process it is of course important to show how the raw material looks
when it enters a vat or a machine, and then show its change after
the process is completed.

Perhaps the first and "most fundamental" problem involves the
question of time. The lecturer had formerly been accustomed to make

drawings on the blackboard and to use charts for explanatory pur-
poses. These were replaced with lantern slides and by this plan,
better drawings were possible and the time needed to make the draw-
ings was saved.

The most serious difficulty which we encountered in our attempt
to teach chemistry by motion pictures came from the fact that the
scenes change so frequently that the student observer retained no
clear cut mental impression of what he had seen. To remedy this,
it was necessary to stop the projector at a critical point in the
study being shown and point out outstanding facts of the pictures.

A second and perhaps a better plan for regular use is to em-
ploy motion pictures for review purposes after the student has had
the opportunity to study the processes in detail from his textbook.

We wish to affirm our faith in the educational value of motion
pictures and to express our belief that visual education will fur-
nish a valuable method for the training of the youth of the future.

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(115) Everett Bowden, "Visual Aids in Chemical Education," Journal
Of Chemical Education, 7:828-33, April, 1930.

Visual education is not new. Its types fall into two groups;
(1) real objects or activities themselves, and (2) representations
of objects or activities. The first includes demonstrations, ex-
periments and excursions or school journeys by which experience is
gained at first hand. The second includes illustrative materials
and devices by which experiences are gained vicariously. Examples

are pictures in textbooks, flat pictures, stereographs, lantern
slides, motion pictures, specimens, models, charts and dramatiza-
tions.

These visual and sensory aids help to supply a common basis of
experiences for both teacher and pupil through words, which arouse
meaningful mental images.

The minimum equipment needed for picture projection:

1. Projection apparatus for still pictures.

2. Projection apparatus for motion-pictures.

3. Suitable projection screens.

4. Electrical outlets.

5. Proper devices for darkening the room.

6.. Projector stands.

7. Library and storage facilities.

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(116) E. J. Giering, jr.,"Motion Pictures As An Aid In Agricultural
Extension Work," Educational Screen, 16:90-91, March, 1937.

With adequate portable sound equipment we of Louisiana are able
to go anywhere in the state and put on a show. We are equipped with
a power plant installed within a large truck for generating the nec-
essary current and voltage. By using films which are applicable to
conditions in our state, it is possible to more thoroughly and
quickly demonstrate to a group the agricultural and home management
practices and methods advocated. Usually a subject is treated by
comparison; i. e., by actually showing the condemned way, say, of

growing cotton and then showing the recommended method.

By making the scenes on the farmer's land with him and the members of his family assisting an intimate aspect is lent which is appealing to their friends and fellow workers over the state. The visual instruction specialist works through county and home agents who are in close contact with a large number of rural perople who need this work.

Our field agents are fully aware of the value of visual instruction. The seasons' practices are the factors which determine what timely pictures should be shown. Some recent films just released are: (1) "For The Land's Sake." This sound motion picture shows how fertility may be returned to the soil. (2) "Growing Sugar Cane The Modern Way." This film shows improving the land by turning under winter legumes; new cultural practices and improved varieties are the high points stressed. (3)"The Cattle Are Coming." Dipping scenes are especially interesting as the necessity for dipping has been removed as a result of a fight on ticks made over a period of thirty years in Louisiana.

Visual education is a device for educational work and the goals set up by the A. and M. College the first year are: first, to stimulate an interest in individuals that will bring about an imppovement in their present practices; second, to present a subject with more force, clearness, and ease of understanding; third, to draw larger attendance at meetings through the novel means of teaching by visual aids.

From present indications, nothing will prevent the increased.

use of motion pictures as a means of visual instruction. Due to circumstances, this growth may be gradual; but it is certain to be steady.

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This article reports the results of a controlled experiment comparing the effect of blackboard and lantern slide presentation of arithmetic combinations when other elements in the teaching method were kept constant.

Two groups had twelve combinations in each group and two had fourteen combinations. The third grade children studied four groups of unknown multiplication and division combinations, each group containing twenty-two combinations. The teacher teaches the combinations to all the children.

Two days' teaching of arithmetic combinations with the lantern gave approximately the same results that three days gave when using blackboard presentation. The blackboard presentation gives 60 per cent at the end of the second day as compared with 75 per cent when combinations are taught by means of lantern slides.

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This chapter of this thesis presents twenty-two articles in Part I and twenty-four in Part II, dealing with the pedagogy of visual education. These articles were taken from modern education-

al periodical literature.

The consensus of opinion of modern educators, as indicated by these annotated articles, is that modern visual education should be definitely integrated with the regular classroom procedure. Sentiment runs to the use of the picture for a definite purpose, and not just as a show attraction, to gain the attention of students; although this is said to be a secondary attribute of well-planned visual aids. It is said that a teacher who knows how to use visual aids effectively and without interfering with the regular routine of lessons is an efficient and effective teacher.

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CHAPTER VII

C O N C L U S I O N

This thesis has presented much material on the subject of visual education, all taken from periodical literature. The general sentiment of these articles has, of course, been favorable to the future and possibilities of visual aids. If we are to take these selected articles as being a representative cross-section of American teachers, then most teachers are in favor of a separate department of visual education for the school. This department, according to the expressed sentiment, should be separate in equipment, administration, and budget. It should, however, work closely with the other divisions of the school in preparing visual helps for these divisions.

Educators are learning, too, that these visual aids require to be administered by a separate department. This is true because visual education has problems which, although they carry directly into every other department of a school, really concern directly no other department. These problems require separate, intelligent administration. There is so much for the youth of to-day to learn, in order to be even moderately well equipped for life in the fast-moving worlds of to-day, that new and better methods of learning are necessary to help the pupil meet the demands of the industrial world. A visual education department supplies these new methods, and thus makes easier the learning process for many students. There is need to be cautious in administering these new methods of learning; for, if visual aids are not properly integrated with the cur-

riculum which is being presented, they are worse than nothing.

The teachers whose opinions are recorded in the annotated ar-
ticles presented in this thesis believe in the use of visual aids
throughout the curriculum, wherever they make possible more effic-
ient or clearer teaching procedure. Visual aids, according to
them, covers the whole range from cartoons and posters, through
flat photographic prints and still book illustrations to motion pic-
tures, both silent and sound. Mention is made, too, of the various
accessories to the standard projector, which permit the showing of
microscopic or macroscopic scenes, or those too fast to be seen by
the naked eye. They believe in the use of all the possible visual
aids named above, where feasible; but they are for economy in their
use, and, for that reason, are in favor of the separate visual ed-
ucation department. The economy the teachers favor does not mean
cheapness of material; rather, it means a careful selection of ma-
chinery and library material with the money at hand, the ends to be
attained, and the amount of service expected taken into considera-
tion.

Classified under the head, "Flat Pictures" mention is made in
the annotated articles of the following kinds of visual aids mate-
rial: photographs, cartoons, and posters. The main opinion of the
annotated articles seems to be that, without flat pictures of one
kind or another, the books and other modern teaching aids would not
be nearly so efficient as they are. This is so because the flat pic-
ture has the ability to arrest motion, to reveal relations not vari-
able with motion, to portray line and color, to portray both two and
three dimensional objects, and to depict any pictorial object, per-

son, or situation in which motion, per se, is not a predominant element. If these articles correctly represent modern educational sentiment in the use of flat pictures, then the use of them is not merely restricted to black and white photographs. Photographs in natural color, cartoons or posters, either in black and white or in color, line engravings, etchings, paintings, water colors---- all these are used in one way or another by the modern educator. Flat pictures of all kinds, then, are used to-day; and they are used in any way which will bring a clearer understanding of the subject at hand.

It is shown from the annotated articles in chapter four that any means of visual education is a definite help, not a hindrance to educators in attempting to put their messages over to their pupils. Experiments herein mentioned show that those pupils taught by films accomplish more and do better work than those taught by regular academic methods. They show that classroom films---- those well selected and taught---- increase the rate and quality of learning. These films arouse interest in the subjects taught, and so stimulate individual research in libraries and in other ways; they improve the general thinking habits and the school work of the children so taught.

One word of caution is shown by these articles, however. It is this; the educational picture is intended to educate, while only the theatrical motion picture is intended to entertain. So, in the selection of pictures for use in visual education, the above-mentioned question should be kept in mind. Pictures should be selected, of course, that will have some interest to the pupil; but they

should also be selected, first, with an eye to the subject taught or the object to be gained, and secondarily for amusement. Classroom films should be carefully integrated with the work at hand, and not shown merely because they are valuable bits of learning in themselves. With these precautions taken, and the learning provided by the projected picture properly followed up with supervised research and planned experiments or studies, an undoubted increase in the quality of education will follow. This is the prime purpose of visual education.

Chapter five presented the views of periodical literature with reference to the problems of equipping a department of visual education. In the equipment of a department of visual education, according to these articles, cognizance must be taken of the following facts: (1) Budget Allowance, (2) Needs the department must fulfill, (3) The number of people the department is expected to serve. If the budget allowance allotted to the visual education department is small, then use may be made of the natural visual aids which surround us, of blackboard sketches, actual visits where possible, and other natural items. As more money is available, projectors, screens and other more expensive items in the visual education equipment may be purchased. Equipment, too, will naturally be different where it is expected to serve the science department, where micro-projectors may be necessary, or where it must serve the history department, where a still film or slide projector may be used in projecting maps and historical scenes. Equipment should be more sturdy if it is expected to serve a large number of people. Either better qual-

ity equipment or more of it may be necessary. At any rate, the best possible equipment for the purposes desired should be purchased and the best possible care taken of it. Educators at present favor separate, especially built quarters or storage cabinets for the department of visual education's equipment. They also favor the use of this equipment only by those who have been especially trained to get the most benefit from the equipment and to care for it properly.

Now, we have our department of visual education. It is properly administered, equipped, and housed. What use can the teacher make of this department, which we have established for his help and benefit? If we take the opinions of the writers of the annotated articles which have been included in chapter six, then the answer is this: a teacher may use visual aids, as supplied by the department of visual education, wherever and whenever they add life and interest to the subject material being taught. These authors, however, stress one word of warning unanimously: that pictures should not be used just as a 'show'---- not to illustrate some trivial point, to the detriment of the main thread of thought. Pictures--- no matter whether still or motion pictures---- should be selected with the situation to be illustrated and the whole course embracing the situation in mind. More than that, once the visual aid is selected, proper advance preparation and follow-up work should be done both by the teacher and the pupils, if the greatest benefit is to be gained from its use. The teacher must be especially well prepared in order that she may answer questions on any new point of view the film may happen to raise in the minds of her pupils. Given, then,

the help of the visual education department in proper mechanical presentation of the aid, proper preparation of the teacher and class, and proper follow-up work, the aid will become a part of the curriculum, instead of being another 'show' soon to be forgotten. In a word, the use of proper visual aids, properly presented and integrated with the course, is the procedure which the pedagogy of modern visual education endorses.

These beliefs are being put into practise to-day. In nearly every school in the United States, some form or other of visual education is being used. No matter how crude some of these methods of illustrating teaching may be, they all work toward a common end----the simplification of education for both the teacher and the pupil. The possibilities of visual education are, however, admittedly unlimited. New inventions, new uses for old processes, new ideas---all these will combine to make the school of tomorrow just as much more enjoyable than those of to-day as the modern school is better than the schools of the 19th century. Visual education will bring the most of these new things as time goes on.

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