DESIGN IN THE EDUCATIONAL FILM: AN ANALYSIS OF PRODUCTION ELEMENTS IN TWENTY-ONE WIDELY USED NON-THEATRICAL MOTION PICTURES

Dissertation
Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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Adviser
For ten years the writer has played a dual role of film-maker and teacher. In the course of this experience, the process of film-making and the problems of teaching have become inseparably intertwined, the one enriching the other in a kind of ebb and flow.

The chapters which follow naturally reflect this inter-related experience, and while they are written with reference to practical problems of communication by means of film, they are fundamentally concerned with how people learn.

Of immediate concern is an analysis of the rhetorical elements in a group of widely-used educational films, and a comparison of the findings with recent experimental evidence on instructional film production and with the accumulated experience of certain successful film practitioners.

A synthesis of science and philosophy, of research and practice, is intended here, in an effort to reach reasonable conclusions and deeper understandings which may be ploughed back into the production of motion pictures for education.

The writer is aware that in using this approach he is treading on vast and boggy ground. Film-making, like teaching, is both an art and a science. The limitations of the present research will shortly be called to attention. But there comes a time in the experience of every film-maker and every teacher, when he is no longer content to work with fragments. He needs a framework, a philosophy, which he
himself must build from the truths and half-truths which lie about him.

This study, then, is a depth analysis of production factors in a group of select educational films, and a synthesis in which the writer seeks to find and test the meanings of what is practiced, proven, and surmised about educational film production, and to thereby lay a firmer foundation for present practice and for future research.

The writer wishes to express his sincere appreciation to his advisor, Dr. Edgar Dale, who has been teacher, counselor, and friend.

He also wishes to acknowledge the unfailing and whole-hearted cooperation of Professor F. W. Davis, Chairman of the Department of Photography at The Ohio State University, where the writer learned much of the science and many of the arts involved in motion picture production.

Robert W. Wagner
Beavfield Depot, Maine
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CHAPTER I
INTRODUCTION

1. The Nature of the Educational Film

"School experiences," according to an eminent philosopher of education, "should be of such a kind as to widen and enrich and give greater meaning to life as it goes on in the out-of-school environment."¹

If we accept Bode's statement, the "classroom" film would simply be one which widens, enriches, and gives greater meaning to life.

Traditionally, however, school experiences are classified into studies or disciplines which, as Dewey describes them, are labeled:

...conventionally and conveniently under these heads:
(1) those especially involving the acquisition of skill in performance—the school arts, such as reading, writing, figuring, and music; (2) those mainly concerned with acquiring knowledge—"informational" studies, such as geography and history; and (3) those in which skill in doing and bulk of information are relatively less important, and appeal to abstract thinking, to "reasoning," is most marked.²

As a result of this classification of school experiences, films for use in the classroom have become similarly grouped as: (1) "instructional" films dealing primarily with the teaching of skills,

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(2) "expository" films, whose purpose is mainly informational, and
(3) "incentive" films in which factual information and the exposition
of skills are less important than the development of attitudes and
the promotion of thought.

The types or genres of educational films have been defined
functionally in a number of different ways by different educators and
film-makers. An examination of a few of such classifications is
interesting, because they reflect opinions on not only what the educa­
tional film should do, but also to a certain extent, what it should be
like.

UNESCO's Commission on Technical Needs with relation to press,
film, and radio, defines two kinds of films which loosely cover the
educational field:

1. Didactic films designed to impart facts, skills,
and attitudes, and

2. The so-called documentary film, usually designed to
give a general impression, but not necessarily to give
particular information.  

Jean Benoit-Levy, formerly Director of Films and Visual Infor­
mation for the United Nations, distinguishes between "the teaching
film," and "the educational film:"

Educational films, though having their roots in
teaching films, are nevertheless vastly different.

We may say that in theory teaching requires the
consent of the mind whereas education requires the con­
sent of the heart, that is, of the individual sensibili­
ity. Naturally, this is only a postulate, for in

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3 Report of the Commission on Technical Needs: Press, Film,
reality mind and heart are not so easily separated.

As a matter of fact, the educational film, distinguished from the teaching, or classroom, film, is intended for all ages at the same time. Its ultimate aim is the education of the masses, and that is its whole function.

For the very reason that it covers so much territory, this film genre must of necessity be divided into two distinct categories: 1. Films meant to be preceded or followed by a lecture; 2. films having a clearly educational purpose, capable of being self-sufficient.4

Another well-known French film producer likewise distinguishes the documentary from the teaching film:

Of the teaching film, one expects a well-demonstrated affirmation; on the contrary, the documentary for the public or for general mass information should not be didactic.5

Painleve, with the schools of France in mind, also details other types of teaching films:

There is the teaching film of which the master can make use during class, a teaching instrument as easy to handle as the blackboard. This is the kind of film, very brief, which deals with one precise point; it can be projected several times and commented on by the master and the pupils....There is the recapitulation film, which may be projected at the end of the study period, and needs previous knowledge duly acquired; this film will be a sound film, and may last ten minutes. There is, finally, the educational film in the widest sense of the word, multiplying centres of interest and exciting the imagination, most often at the expense of mental concentration. One can find many of them among the documentaries intended for public showing.6

6 Ibid., pp. 50-51.
Dale, too, describes two categories of films specifically educational in intent:

The instructional film, usually one or two reels long, is designed to teach a particular concept, principle, or generalization; to build an attitude or outlook; or to develop a skill. Its subject-matter range is deliberately narrow to reach clear-cut, limited goals. It is, in short, a lesson, with all the advantages and disadvantages of a coordinated, pre-planned approach.

The documentary film also is characterized by a specific teaching purpose, though its technique consists in showing the effects of certain conditions upon individuals or groups. From a documentary film you do not learn how to operate a lathe, but you begin to grasp the meaning of the lathe in the world in which we live, and the effect upon the lathe operator of the kind of work he does. The documentary film offers more context than does the instructional film. It is not so limited in approach—its sweep in time and space is likely to be greater.

The films made by the First Motion Picture Unit of the Army Air Forces during World War II were typed in four main categories:

Educational Films, primarily imparting information;
Orientation Films, primarily creating or changing attitudes toward the war, jobs, obligations, regulations, or codes;
Education-Orientation Films, having the dual purpose of giving information and of changing attitudes (any film attempting to impart information will also have an effect on attitudes, and any film for changing attitudes will necessarily impart information); and Special-Psychological Test Films, designed for learning and aptitude measurements.

Wittlich describes four kinds of films, evaluating their usefulness in the classroom as follows:

The entertainment film aims at emotional rather than intellectual appeal, and may or may not contribute to broad cultural backgrounds. Since it is not concerned...
with age of audience, subject-matter or academic criteria, any contribution that the entertainment film makes to the classroom is usually incidental or supplemental.

The advertising film is made for the primary purpose of promoting sales of the services or goods of the advertiser who is the sponsor or producer of the film.

The documentary film is one which deals with a social situation. It attempts, in a realistic, undisguised and authentic manner, to interpret the events, the cultures, or the problems of the day for the purpose of assisting man to understand his place in society and to stimulate constructive thinking and planning for the future.

The text film is one which is made to become an integral part of a socially desirable course of study by furnishing desirable experiences which otherwise would be inaccessible to the students.9

Six groups of educational films are identified by McKown and Roberts, and four kinds of classroom films.

Educational films may be divided into six groups: (1) classroom films, (2) industrial films, (3) school-made films, (4) documentary films, (5) newsreels, and (6) photoplays. The great majority of classroom films may be classified under one of the following headings: (1) films explaining a process; (2) films giving information; (3) films demonstrating a skill; and (4) films dramatizing an event, episode, or the life of an individual...

These classifications are not mutually exclusive. Obviously, under certain circumstances probably all films could be classified as informational. Some of the films dramatizing an event, episode, or the life of an individual could be classified as documentary or newsreel. However, for the purpose of showing the main emphases of the various types of films, this classification is satisfactory.10

Finally, McClusky defines eleven functionally different kinds of educational films:

...The narrative film, which tells a story based on fiction or fact...the dramatic film, which is primarily theatrical...the discursive film, which presents a topic or series of related topics in a logical, systematic, and authentic manner...the evidential film, which is used chiefly to record scientific data for study and analysis...the factual film, which treats a topic or series of topics in an encyclopedic manner...the emulative film, which shows how to perform an act of skill or demonstrates patterns of behavior which the learner imitates...the problematic film, which sets problems for discussion and supplies the basic data for thinking...the incentive film, which motivates action in the direction of developing character, attitudes, morale, and emotional response...the rhythmic film, which is used to achieve artistic effects and to develop aesthetic responses...the therapeutic film, which is used in medicine in connection with the educational rehabilitation of psycho-neurotic patients...the drill film, which sets forth repetitive exercises in which the observer participates during the showing of the film.11

This brief survey clearly shows that much is expected of the motion picture. Educators believe it can provide a variety of worthwhile experiences consistent with the prevailing goals of education. But the definitions reported above also reflect the tendency to compartmentalize knowledge into "skills," "information," and "knowledge."

This, in turn, serves to determine the rhetorical characteristics of two general types of films for education, and set a pattern for their design. The "classroom," or "teaching," or "instructional" film thereby becomes a vehicle for imparting information. It is "didactic." It is "a lesson," designed for "clear-out, limited goals."

It is the kind of film which "requires the consent of the mind."
Interest is assumed. The appeal is "intellectual."

On the other hand, the "educational" film, which includes the documentary, and to a limited extent the entertainment film, is one which is supposed to build an "emotional rather than intellectual appeal." While it "offers more context than the instructional film," its limitation is that it frequently lacks real informational content, "exciting the imagination often at the expense of mental concentration."

These two extremes represent opposite ends of what is obviously a grey-scale. "In reality mind and heart are not so easily separated," as Jean Benoit-Levy puts it. Or, as Greenberg and Wald note, "any film attempting to impart information will also have an effect on attitudes, and any film for changing attitudes will necessarily impart information."

Bode sums it up this way:

Thinking, appreciation, skill, and information are intimately interrelated. Thinking has to do with the removal of obstacles, and this involves an element of concern or value; else why take the trouble to think at all? The successful culmination of thinking has an attendant esthetic quality, as when we speak in mathematics of a "beautiful demonstration." 12

The schismatic thinking which separates the "mind" from the emotions is in retreat, and with it the all-too neat categorizations of films into air-tight compartments. Most writers, in identifying

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12 Bode, op. cit., pp. 248-249.
types of educational films, admit the looseness of their classifications, characterize their effort as being "for purposes of convenience only."

Contributing to this breakdown of categories is the fact that experienced educators have found interest to be a common factor in learning of all types. This idea is now being carried over into film production. It has been found, for example, that:

The basic factors that make films entertaining in the theater make them interesting in school. Interest and entertainment are highly related, even in their etymology. "Interest" literally means "to hold between." A motion picture succeeds as entertainment when it "holds" its audience, and the hold of the theatrical film on the audience is broken by the happy resolution of the dramatic motives and actions on the screen. The audience leaves the theater with no feeling of obligation.

Interest, on the other hand, extends over and beyond the immediate object of attention. When an interest is aroused by a motion picture, it does not subside when the picture fades from the screen but continues and develops into various forms of intellectual activity. The continuing nature of interest is one of the determining differences between films made for entertainment in the theater and films made for education in the school, for interest implies continuing intellectual activity, while entertainment is satisfied with a momentary state of pleasant feeling and emotion. One of the major values of motion pictures in the school is not that they entertain the students but that they develop interest among them.13

Although Hoban, above, has chosen to characterize the "entertainment" film by its temporary significance, McKown and Roberts, Wittich, and Dale all note the possible educational effect of the

Hollywood product, and a number of studies which will be mentioned later, show that the effects of the entertainment film may actually be both deep and lasting.

The extensive instructional film survey, undertaken jointly by the Department of the Army and the Department of the Navy at the Pennsylvania State College, included films produced to entertain in theaters as well as those used in schools, colleges, and military training programs since, as an official report indicates, "from an educational point of view, a hard and fast distinction between education and entertainment is not acceptable because the distinctions are misleading."

A former supervisor of teaching aids in the Mishawaka, Indiana, Public Schools writes:

The early, erroneous belief that a double standard existed for educational and entertainment motion pictures is gradually being dissipated. We realize now that a motion picture is a motion picture, whether viewed in a darkened classroom or the plush and chrome luxury of the corner Rivoli. Good camera technique is the same in both places. Understandable, undistorted, realistic sound strikes the ear the same in Eggs as in The Egg and I. It is important, then, to select films which the class may accept as standard in this important medium of communication. The film must be well conceived, well executed, and true. Anything less is a disservice to the educational screen.

And F. Dean McClusky points out:


To separate motion pictures into two classifications, (1) those which entertain and (2) those which educate, is not paralleled in the teaching of literature and drama in the schools. Many novels and plays which were written in the first instance to entertain are used in schools for highly desirable educational purposes. The novels of Charles Dickens and the plays of Shakespeare were not written as school textbooks, but no one would question their educative value in the study of English literature. The distinction is rather one of use than of something inherently different in the nature of the films themselves. The motion picture David Copperfield was produced to entertain, but it is highly regarded by teachers of English as having educational value for the study of Dickens.

Obviously not all films made for entertainment purposes would be selected by educators for school use. Teachers select films for purposes different from those in the minds of the theatrical exhibitors. Just as teachers are careful to select educationally desirable novels and plays for use in teaching literature, so do they evaluate films for classroom use. The demands of education and of entertainment are not the same; but a film that is entertaining may be educative as well. And a film which may be highly educational may also have distinct value when shown in theaters. Rigidly to classify films as educational on the one hand and entertaining on the other is not sound.16

Finally, the difficulty of making clear-cut distinctions between the "teaching" film, the "educational" film, and the "entertainment" film, has been further complicated in recent years by the production of motion pictures which, even though widely used in the schools, actually fall into none of the established categories for classroom films. This fact is noted by Waldron in her report on The Information Film, the result of a study sponsored jointly by the Public Library Inquiry and the Twentieth Century Fund:

16 McClusky, loc. cit.
Among film makers and users there are always arguments as to what is a good film. Can documentaries (in the pure sense) have a greater educational impact than routine classroom films? Can a film be educationally effective if it is dull? One of the more noticeable trends in non-theatrical films is a growing tendency for "purist" lines and specialization to disappear—for the concept of what films can and should do to broaden out.  

Mentioning films like Boundary Lines, The Feeling of Rejection, The Story of Menstruation, and Fiddle- Dee- Dee, Waldron concludes that "more and more, films are being judged on their merits—whether they achieve what they set out to do in their own artistic and intellectual terms—rather than on preconceived notions of what those terms should be."  

This trend away from rigid classification and typing of educational films, then, appears to follow that general development of educational theory in which interest is regarded as a key element in the learning process. It represents that part of educational thought which seeks to relate learning to the larger world about us, and is symbolic of the teacher who uses film not only to inform, but also to create interest in that world. 

In many instances, this has resulted in a movement away from rigid groupings of studies, towards a more sensible, realistic curriculum in which the rich and diversified facets of human experience are related to the finding and testing of meanings in problem-solving.
situations. Dewey has pointed out the pitfalls of isolating studies into those involving "skills," "information," and "abstract thinking." "Skill studies," he says, "are liable to become purely mechanical... informational studies may fail to develop wisdom... disciplinary studies are liable to lose contact with the practical." 19

It would appear that we acquire ways of thinking and doing by the same process—through a reconstruction of experience from which evolves a new way of "feeling" and "thinking." This implies a new concept of what the "educational" film might be like.

It means that films teaching skills do not have to be didactic, devoid of interest, or patterned on the conventional "lesson plan," and that they can and should be related to the larger world to which that skill contributes. It means that films designed for motivational or instigational purposes need not, in fact, cannot be based wholly on emotional appeal. It implies a recognition of the need for films which are not completely polarised emotionally or intellectually, but which are conceived in terms of the inseparability of these two elements in the learning process itself.

A final implication growing from the consideration of the nature of the educational film is that good film form is basic to all the uses to which motion pictures may be put. We find "a motion picture is a motion picture, whether viewed in a darkened classroom or the plush and chrome luxury of the corner Rivoli," and that films are

coming to be judged on their merits as films, on "whether they achieve what they set out to do in their own artistic and intellectual terms—rather than on preconceived notions of what those terms should be."

The present trend towards greater richness and diversity of productions in the non-theatrical field promises even greater possibilities for the use of the motion picture in education, and as a medium of communication.

2. Communication and the Film Communique

Before proceeding with an analysis of the motion picture form, it is necessary to define what shall hereafter be referred to as "the process of communication," and to clarify the nature of communication by film.

Communication has been described as ranging from a drumbeat in the jungle or the wink of an eyelash, to the most abstract writings of a James Joyce and the daubings of Dali. Lasswell, in a succinct analysis, suggests that a convenient way to describe an act of communication is to answer the following questions:

Who
Says What
In Which Channel
To Whom
With What Effect

Schramm points out that communication always requires three elements: (1) the sender, (2) the message, and (3) the receiver. He

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then details the process by which the sender attempts to bring his
message into common understanding with the receiver.

Now what happens when the sender tries to build up
this "commonness" with his intended receiver? First, the
sender encodes his message. That is, he takes the infor­
mation or feeling he wants to share and puts it into a
form that can be transmitted. The "pictures in our heads"
can't be transmitted until they are coded. When they
are coded into spoken words, they can be transmitted
easily and effectively, but they can't travel very far
unless radio carries them. If they are coded into written
words, they go more slowly than spoken words, but they go
farther and last longer. Indeed, some messages long out­
live their senders—the Iliad, for instance; the Gettys­
burg address; Chartres cathedral. Once coded and sent, a
message is quite free of its sender, and what it does is
beyond the power of the sender to change. Every writer
feels a sense of helplessness when he finally commits his
story or his poem to print; you doubtless feel the same
way when you mail an important letter. Will it reach the
right person? Will he understand it as you intend him to?
Will he respond as you want him to? For in order to
complete the act of communication the message must be de­
coded. And there is a good reason, as we shall see, for
the sender to wonder whether his receiver will really be in
tune with him, whether the message will be interpreted
without distortion; whether the "picture in the head" of
the receiver will bear any resemblance to that in the head
of the sender.

We are talking about something very like a radio or
telephone circuit. In fact, it is perfectly possible to
draw a picture of the human communication system that way:

![Diagram of communication system]

**FIGURE I**
Substitute "microphone" for encoder, and "earphone" for "decoder" and you are talking about electronic communication. Consider that the "sender" and "encoder" are one person, "decoder" and "receiver" are another, and the signal is language, and you are talking about human communication.21

Other writers feel that the process of communication is somewhat more subtle and certainly more complicated than Schramm's symbolization. Wendell Johnson, for example, sketches the following schematic representation of what goes on when Mr. A talks to Mr. B:

![Diagram](https://example.com/diagram.png)

**FIGURE 2**

**KEY:**

1. An event occurs (any first order fact serving as a source of sensory stimulation)

2. which stimulates Mr. A. through eyes, ears, or other sensory organs, and the resulting

3. nervous impulses travel to Mr. A.'s brain, and from there to his muscles and glands, producing tensions, preverbal "feelings," etc.,

4. to which Mr. A then begins to translate into words, according to his accustomed verbal patterns, and out of all the words he "thinks of"

5. he "selects," or abstracts, certain ones which he arranges in some fashion, and then

6. by means of sound waves and light waves, Mr. A. speaks to Mr. B.,

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7. whose ears and eyes are stimulated by the sound waves and light waves, respectively, and the resulting nervous impulses travel to Mr. B.'s brain, and from there to his muscles and glands, producing tensions, perverbal "feelings," etc.

8. which Mr. B. then begins to translate into words, according to his accustomed verbal patterns, and out of all the words he "thinks of"

9. he "selects," or abstracts, certain ones, which he arranges in some fashion and then Mr. B. speaks, or acts, accordingly, thereby stimulating Mr. A.—or somebody else—and so the process of communication goes on, and on...

The intent of the communicator, latent or overt, concerns the student of communication, and the consideration of this factor appears throughout the classic theories of communication. Plato, for example, would win men's souls to the truth through what he called "dialectical rhetoric." Most discussions of communication today likewise state, or assume the intent of the communicator to modify or affect the behavior of the communicatee.

In analyzing a conversation, a lecture, a book, or some other example of communication, we generally find that the communicator is trying to bring about some change in the communicant. He is attempting to share an experience, to explain something, or to induce an attitude—all of which involve changing the communicant's orientation.

Lasswell defines "efficient communication" as that communication having as its purpose the facilitation of rational judgments, "when it


aids survival, or some other specified need of the aggregate." 25

Describing the desirable goal of communication as "participation," Dale says:

The definition of communication that I like best is called archaic by the dictionary. It describes communication as meaning "to share in common, to participate in"...

As we look at communication, therefore, we must see it as a sharing process, as a process by means of which boys and girls, men and women grow, as a process from which we exclude no one. We are trying to build an "inclusive" society, not an "exclusive" one. Communication, therefore, is thwarted in an atmosphere of authoritarianism, in an atmosphere of compulsion, in an atmosphere of segregation. It is facilitated when pupils feel that we are all in this together. We communicate best when we participate as equals. 26

Several points growing out of this survey of theories of communication, which help us better understand the nature of the educational motion picture, follow.

(1) It is obvious that communication involves a communicator and a communicatee. The film maker must know, clearly and sharply, with whom he is communicating. He must know his audience.

(2) Communication also means content—that which is communicated. The problem of what shall be taught is one of curriculum-building. The parallelism of curriculum design and educational film design has been discussed in the previous section.

(3) Intent is involved in communication, as it is in education. The communicator, teacher or film maker, is trying to influence the

25 Lasswell, op. cit., p. 46.
opinions, attitudes, or behavior of the communicatee. This purpose may be concealed or open. Where, as in a democracy, we are trying to build an "inclusive" society, our purposes are openly acknowledged and freely communicated. Elsewhere, in the building of an "exclusive" society, purposes may be concealed, and communication, to that degree, is restricted. The film-communicator in a democratic society, therefore, is he who uses the medium for "the facilitation of rational judgments," and the building of an "inclusive" society.

(4) Communication has, as its end product, some form of action, or reaction. It may involve immediate or delayed "feedback" or interaction between the communicator and communicatee which may either be momentary or may continue indefinitely. The film-maker will, therefore, have to define the effect desired if he wishes his product to be consumated as communication. He will also keep in direct contact with his audience for that personal "feedback" which alone can tell him to what extent he is successful. He will not rely on "box-office" reports alone.

(5) Finally, there is the signal, or medium of communication. For all except the blind and deaf, the communique is in the form of light and sound waves—gestures, written or spoken words, pictures, colors, noises, music—singly or in combination, all vibrating at their own frequencies in the electro-magnetic spectrum.

In the motion picture, we have a symbol-signal system in which the elements of sound, color, motion, and visual imagery may be combined to form a highly complex and often very effective medium of communication in the terms described above.
Whereas traditional materials of instruction are usually interpreted by a single sensory receptor, the eye or the ear, the sound motion-picture film calls for joint sensory reception.

When a pupil reads a book, he responds to a series of visual stimuli. When he listens to the radio or to recordings, he responds to a series of auditory stimuli. In the case of a sound film, he sees and hears simultaneously; both the eye and the ear are focussed on the stimuli. The sight-and-sound way of learning closely resembles the way the child naturally becomes aware of his surroundings as he goes to school, plays games, and participates in home and family activities.

Because the teaching film attracts the attention of both ears and eyes and so closely approximates natural learning conditions and stimuli, it produces heightened interest and understanding in the learner. It is natural for children to be interested in a communication medium that challenges their attention simultaneously, both visual and auditory.\footnote{Mittich, W. A., and Schuller, C. F. \textit{Audio-Visual Materials: Their Nature and Use.} New York: Harper \\& Brothers, 1953, p. 380.}

While the above is oversimplified and somewhat optimistic, it is known that the film communique can attract and hold attention. It has a wide and interested audience of potential communicatees. Its content is as wide and rich as human experience itself. And its end product is often strikingly illustrated in terms of action.

Shifts in attitudes have been noted in a dozen investigations of film effects, and the amount of information learned is measurable as demonstrated in an early study by Holaday and Stoddard.\footnote{Holaday, P. W., and Stoddard, G. D. \textit{Getting Ideas from the Movies.} New York: Macmillan, 1935.} Retention of information gained from film is high too. Film learning does not follow the classical Ebbinghaus curve of forgetting. This fact appears
in studies such as those of Holoday and Stoddard,29 Hovland, Lumsdaine, and Sheffield;30 Knowlton and Tilton;31 Rulon;32 and others.

While the motion picture communiqué, therefore, appears to be an effective link between the communicator and the communicatee, it is obvious, from our previous examination of the complexities of the process of communication, that no symbol system can be relied upon as the perfect medium of communication. Verbal and pictorial symbols must be "coded," and "decoded." A picture, like the word once described by Chief Justice Holmes, "is not a crystal, transparent and unchanged; it is the skin of a living thought and may vary greatly in color and content according to the circumstances and the time in which it is used." The coding and decoding of verbal and pictorial symbols sets up a dynamic field in which the experiential background of the communicator is in interaction with that of the communicatee, through a given medium of communication.

In a theoretical sense:

...we can never completely communicate with one another, since we can never realize the full response of another person to a given situation. To that extent we all go

29 Loc. cit.
about talking and listening to ourselves. The inability to transcend one's own experience is one of the major obstacles to adequate communication.33

In a practical sense, however, the evidence of the usefulness of the sound motion picture is such that it must be regarded as one of the most successful symbol-systems yet devised to bring about that "sharing in common" which distinguishes effective communication.

The question facing the producer of the educational film is how to design the successful symbol system which will promote common understandings, and create the conditions under which learning may best take place.

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33 Hartley and Hartley, op. cit., p. 75.
CHAPTER II

PURPOSE OF THE PRESENT STUDY

1. The Problem

The present study is one of analysis and synthesis. It is (1) a depth analysis of some of the more important production factors found in twenty-one widely used educational films, and (2) a synthesis of the findings with existing empirical and experimental evidence related to these factors.

If successful, the investigation should provide an analytical basis by means of which the serious producer of films for education may improve his product and better understand his role as communicator of ideas. The study may also serve to outline areas of needed research with relation to production techniques in the educational film.

As a framework and background, the introductory chapter of this investigation suggested how film design is conditioned by the school curriculum, and by theories of teaching and learning. The nature of the film communique was also discussed, and the process of communication was recognized as a complex and highly integrated event, described by one writer as "a unity, a state of communion,"¹ and by another as "a global state."² In evaluating what is said hereafter,

² Hartley and Hartley, op. cit., p. 105.
with regard to specific film techniques, it should be remembered that communication by film is a dynamic process, all elements in the situation—the audience, time, place, and circumstances of showing—modifying one another reciprocally.

At the same time, it seems necessary to develop a thoughtful approach to film making on the basis of what we already know. Certain films have been widely and successfully used. It is reasonable to assume that they communicate. It also seems reasonable to assume that in a detailed study of a group of motion pictures widely used by both adult and school groups, we may define and rationalize some of the production techniques which contribute to the success of the film communiqué.

2. Previous Research

Experiments with film form began in the pioneering days of Thomas Edison, George Méliès, Thomas Armat, Francis Jenkins, William Friese-Green, Eadweard Muybridge, and E. J. Marey. D. W. Griffith worked out film rhetoric on a strictly pragmatic basis. His use of the close-up for accent, parallel action for suspense, and flash-backs for storytelling purposes, opened up new possibilities for the medium.

The importance of Griffith's innovations was realized in a practical way by the American cinema, which continued to use his techniques without realizing it in specific terms as a science, because knowledge of psychology had not been developed to the point of accurate scientific measurement of cause and effect. It was only fifteen years later when the Soviet directors Kuleshov, Eisenstein and Pudovkin had studied Griffith's films in conjunction with the results of Pavlov's laboratory experiments on
conditioned reflexes, that it was possible to demonstrate for the first time how mind-conditioning was effected through the silent film.\footnote{Robson, E. W., and Robson, M. M. \textit{The Film Answers Back: An Historical Appreciation of the Cinema.} London: John Lane The Bodley Head, 1939, pp. 80-81.}

Although many early film makers did not intellectualize their efforts, and others who did so adopted the behavioristic psychology of their time, they did put together motion pictures like Griffith's \textit{Birth of a Nation}, and Eisenstein's \textit{Battleship Potemkin} which are even today considered classics of film structure.

From Germany, there had been learnt the expressive capabilities of the camera and its movements; from Russia, the scientific approach to the celluloid and use of everyday material and themes as a basis upon which to build a symphonic cinematic structure; from America, a mechanical brilliance combined with an exploitation of human emotions, from the world as a whole, the urgent need for the recognition of the remarkable resources for the expression of more profound ideas than ephemeral story-films for middle-class entertainment.\footnote{Rotha, Paul. \textit{For Filmgoers Only.} London: Faber and Faber Ltd., 1934, p. 32.}

From the very start, film makers worked to make their product more entertaining, more exciting, more unusual. Their purpose was not to educate, but in many cases their films inadvertently did so. And the practical film producer, with the object of making more money, did develop motion picture techniques and cinematic skills to the point where fifty to eighty million people were willing to pay to see his product each week in this country alone.

The whole history of the motion picture is "experimental" in the sense that creative film practitioners, in the process of making films,
have also been pragmatically engaged in developing and testing the effectiveness of various film forms.

Today, in addition to classic literature on the motion picture, more than three hundred studies of film utilisation made by educators during the past thirty-five years are available to the research worker.

The earliest of these studies appears to be that of Sumstine, in 1918, followed by the first specific investigation of an educational film by Lashley and Watson, in 1922. A complete account of general research in the audio-visual field is found in the Forty-eighth Yearbook of the National Society for the Study of Education, and a shorter overview has been authored by William Allen.

Not until World War II was any serious experimental research done specifically relating to production techniques in educational films. From this time forward, however, attempts have been made to isolate and test definable variables or processes which might improve the instructional effectiveness of films and at the same time possibly reduce their cost.


Hoban's book, *Movies That Teach*, from which the writer has quoted liberally, includes, from the viewpoint of a film producer, one of the most provocative considerations of the techniques of educational film making to emerge from war-film production experience. His chapters, "Approaches to New Film Production," and "Teaching Techniques in Films," bring to sharp focus the responsibilities of the producer in the process of communication by motion picture.

Other products of wartime film research include the works of Miles and Spain; Wittich and Fowlkes; Hovland, Lumsdaine, and Sheffield; Sturmthal and Curtis; and studies by the Yale Motion Picture Research Project, and the Commonwealth of Australia Office of Education.

The most systematic and detailed experimental approach to the study of the film communique, has been undertaken at the Instructional Film Research Center at the Pennsylvania State College where, through

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12 Hovland, Lumsdaine, Sheffield. *Loc. cit.*
the production of multiple versions of the same film, and other tech-
niques, extensive analyses have been made of many elements of film
rhetoric, singly, and in combination. Many of these experiments deal
with skills—gunnery techniques, knot-tying, assembling a breech-
block, and the like. The objective is "100 per cent learning," in a
scientific attempt to make the instructional film do exactly and fully
what it is intended to do. This maximum effectiveness is to be
achieved at a minimum production expense.

All branches of the Armed Forces have become vitally interested
in improving the efficiency of the instructional film; a fact which
signifies a wide belief in the value of the film communiqué. In each
case, "efficiency experts" in the form of psychologists and educators
were hired to find ways to produce more effective training films. The
military viewpoint is expressed in an article written in 1944 by
Lieutenant-Commander Orville Goldner, Head of the Training Film
Branch, Bureau of Aeronautics, U. S. Navy:

It is necessary now to check the terms, to eliminate
the confusion—in fact, to dissolve the mystery and the
unpredictability which characterizes the motion picture
business as a whole.

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16 Gibson, J. J., editor. Motion Picture Testing and Research
Report No. 7, Army Air Forces Aviation Psychology Program Research
17 Roshal, S. M. "Effects of Learner Representation in Film-
mediated Perceptual-Motor Learning." Technical Report SDC 269-7-5,
State College, Pa.: Instructional Film Research Program, The Pennsyl-
vania State College, 1949.
18 Jasper, N. "Especially Designed Motion Pictures: I. Assembly
At this stage of the training film job with thousands of effective and ineffective specimens at hand, it makes good sense to analyze as scientifically as possible that ephemeral screen experience for training to see "what makes it click." Only by dissection, analysis, and definition can we hope to get closer to understanding and creating the special film that is to be the sharp and dependable tool for training.19

The job of finding out what makes the training film "click," has proven less simple than Goldner and possibly many other early experimenters might have thought. It has involved multiple-variable analysis, the production of alternate film versions, and a great deal of expense. Nevertheless, detailed investigations of film rhetoric will, and should, continue.

Of all previous research, only one study parallels the approach of the present investigation.

This is a study by Harber, made at the University of Southern California, titled: "Production Techniques Used in Five Successful Educational Films."20

The purpose of the investigation was: (1) to examine some specific films considered educationally and financially sound by audiovisual directors and coordinators of the schools of California, and to discover which films were used most frequently in the California schools; (2) to study the production techniques of the producers of films ranked highest both by school usage and personal opinion of


experts in the field of audio-visual education; and (3) to suggest some production practices for successful educational films.

Harber developed two survey forms which were distributed by the Bureau of Audio-Visual Education of the California State Department of Education to audio-visual directors and coordinators throughout the state. One form was designed to discover which films were most requested by teachers, the other to get an opinion on which films were considered best by audio-visual experts.

In replies from 66 school districts, 310 film titles were listed as best, and 378 as used most frequently. The ten titles appearing most frequently were selected from each list. In compiling these titles, it was discovered that five films appeared on both lists, and these were chosen for study of production techniques.

The five films were: Mission Life, Rancho Life, Wonders In Your Own Back Yard, Eighteenth Century Life in Williamsburg, Virginia, and Monarch Butterfly.

These were viewed and analyzed for story content, educational principles, and film technique. An interview form outlining production information desired was mailed to the out-of-state producer of the Williamsburg film. This same form was used as a guide for the personal interviews with the three local producers.

Harber found that technical factors and production techniques in the films varied widely, but observed certain similarities which he phrased in terms of a set of generalizations:

1. The films studied fit a specific need in the California school curriculum and are utilized in definite grade levels.
2. Camera technique and editorial pacing were determined by the age level of the intended audience.

3. Vocabulary level was within the range of understanding of the intended audience.

4. The number of concepts to be presented was determined by the maturity of the target audience as well as the length of the film.

5. Producers of the films carefully avoided content or styles that would quickly become outdated.

While Harber's study, like the present investigation, is based on an analysis of production elements in a group of widely used educational films, several significant differences are apparent in the two studies. The present investigation is based on a national survey of most used films, while Harber drew his information from films reported most used in the California schools. Harber analyzes five films, while the present study considers a list of twenty-one films, differentiating and comparing films used on the school level with films used on the adult level. None of the five films reported as most used and approved in the California survey appear in the list used in the present study. Finally, the present study involves a synthesis of the findings with empirical and experimental evidence on the production elements analyzed in an attempt to better understand the whole process of communication by film.

Harber's findings, although based on a limited investigation, are consistent with existing research on what makes an educational film useful, and many of his generalizations are broad enough to apply to the films in the present study, as will be seen later.
The continued survey of film preferences in the non-theatrical field, and the constant analysis of widely accepted motion pictures, would appear to be a fruitful field for long-time research. This would be a kind of "market research" familiar to the business world. Applied to the educational film at both the local and national levels, such a continuing study might yield results of immediate interest to the film producer, and of long-range importance to the educator and student concerned with the development of the motion picture as a medium of communication.

3. The Method

The springboard for the present investigation was provided early in 1955 with the Educational Film Library Association's "Report on Most Used Films." This report was the result of a survey of the membership of the Association, to which questionnaires had been sent requesting that the titles of the ten or fifteen most used films in each of the classifications (school films, and adult films) be filled in. The returns were tabulated with the help of the College Entrance Book Company Staff. The following procedure was observed:

Only questionnaires from educational organizations with active film libraries were tabulated. Commercial libraries and distributors were not counted. Those answering included universities, colleges, city and county school systems, public libraries, and museums. Although the official request was for the ten top titles in each area, the questionnaire allowed space for fifteen titles, and many took advantage of this. No attempt

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was made to have the library rate the degree of popularity among the ten or fifteen titles mentioned. Each mention was tabulated once under either the school or adult heading, as given by the library, and once on the total listing. Some films proved to have considerable use in both fields.

A total of 154 questionnaires were tabulated. From this group 932 film titles were listed. Many titles were mentioned only once or twice, but 149 films were reported from three or more libraries. The following lists show the most popular films in each category, with the number of libraries reporting.22

FILMS REPORTED AS MOST USED IN THE SCHOOL FIELD

<table>
<thead>
<tr>
<th>Title</th>
<th>Libraries Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventures of Bunny Rabbit</td>
<td>23</td>
</tr>
<tr>
<td>Colonial Children</td>
<td>21</td>
</tr>
<tr>
<td>Gray Squirrel</td>
<td>18</td>
</tr>
<tr>
<td>The Loom's Necklace</td>
<td>15</td>
</tr>
<tr>
<td>Autumn on the Farm</td>
<td>14</td>
</tr>
<tr>
<td>Land of Liberty</td>
<td>13</td>
</tr>
<tr>
<td>The River</td>
<td>13</td>
</tr>
<tr>
<td>Common Animals of the Woods</td>
<td>12</td>
</tr>
<tr>
<td>Farm Animals</td>
<td>12</td>
</tr>
</tbody>
</table>

22 Ibid., p. 5.
The list of nine school films and the list of thirteen films reported as most used by adults were selected for analysis, since this procedure offered an opportunity for comparisons of films intended for two different audiences. The River, which appears in both lists, was considered a separate entry in each list for comparative purposes, so that a total of twenty-two films is referred to in speaking...
of the school films vs. the films in the adult list. Generalizations on the total list of films regardless of the level for which they were intended, are made on the basis of the total of twenty-one individual films found in both lists.

The writer sent letters to the producers of these films requesting a copy of the script and other available materials, such as teacher's guides, and still pictures taken from the film.

Scripts were obtained for sixteen of the twenty-one films studied, and in these cases analysis was based both on the script and on repeated screenings of the picture. No scripts were available for *Land of Liberty, Preface to a Life, Angry Boy, Overdependency,* or *Feeling of Hostility.* In these cases, transcripts were made from the films themselves to secure needed data, as, for example, necessary samples of narration for the determination of the grade level of verbalization.

In analyzing the design of these most used films, it was decided to confine the study to production elements which met the following criteria:

a. They had to be elements which could be identified and defined with reasonable accuracy.

b. They had to be elements on which there exists some experimental evidence against which the present findings could be checked and evaluated.

c. They had to be elements of practical importance to the producer of educational films.
Orientation for the present study was found in Smith and Van Ormer's description of film characteristics which lend themselves to evaluation; in Chapter VIII of *Instructional Film Research, 1918-1950*, in which variables in the production and use of motion pictures are discussed and the experimental evidence is summarized; and in Chapters IV and V of Hoban's book, *Movies That Teach*.

In addition, a body of what the writer has called "empirical," or non-experimental evidence on motion picture techniques was collected from the writings of prominent educational, documentary, and entertainment film makers, and from the judgments and opinions of teachers, and others concerned with the use of films in education.

With this background, and on the basis of the three-point criteria mentioned earlier, the following production elements were analyzed in twenty-one motion pictures listed as most widely used in a recent survey of member libraries in the Educational Film Library Association:

1. **Organizational factors.** What may we conclude with regard to (a) film length, (b) the use of introductions and summaries, and (c) repetition?

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2. **Vocabulary level and rate of verbal delivery.** Is the "readability" of the narration at or near the grade level for which the film is intended? What is the pacing of the narrator's delivery?

3. **Audience involvement.** To what extent are the elements of (a) identification, (b) familiarity, (c) anticipation, (d) dramatic structure, and (e) participation used to involve the audience emotionally in the content of the film?

4. **Camera interpretation.** How does camera handling, selection of viewpoint, and camera angle advance the purpose of the presentation?

5. **Color.** What proportion of the selected films are in color? What function or functions are served by the use of this element?

6. **Animation.** How, and to what extent, is this distinctly cinematic technique used?

7. **Music and sound effects.** How, and to what extent, are these elements used?

8. **Optical and special effects.** To what extent are conventional optical effects used? What types of special effects are found in the selected films, and how are they used?

In order to secure necessary information on these points, each film was viewed at least three times. Available scripts were studied, and a number of sub-studies were set up, the methods of which will be described as each production element is discussed.

The findings were then compared with existing empirical and experimental evidence on the same points. Chapters IV to XI, which deal with these production elements, are therefore organized in three main parts: (1) **evidence from the present study,** (3) **empirical**
and (3) experimental evidence. Each chapter concludes with a summary.

4. Limitations of the Study

As Hoban aptly put it:

The general subject of educational motion pictures must be approached in a spirit of intellectual humility, and no single phase of the subject calls for more humility than the matter of techniques in films that make them educationally effective.

The problem posed by this study suggests a number of limitations.

1. The first is the wide scope of the investigation. It is an analysis and a synthesis. As a study of the over-all design of the selected films, however, the investigation had to be broad enough to provide perspective.

2. A second limitation is that the films selected, although widely used, do not necessarily represent the "best" teaching films now available. Many of them are quite old, and a few are technically not up to the highest production standards of recent years. In the list are doubtless some films which teachers continue to request out of sheer habit, lack of knowledge of newer and perhaps better films on the same subject, or simply because these films happen to be accessible.

The fact remains, however, that the films in this group have been requested many times, and are widely shown by public school teachers, college and university instructors, and leaders of adult groups. In

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Hoban, *Movies That Teach*, *op. cit.*, p. 86.
some cases, they have received critical acclaim, as, for example, *Angry Boy* which, in a review in *Educational Screen* for June, 1951, was highly recommended for its "superb photography, casting, editing, and sounding." At least four of the films selected have received international recognition. *The Loon's Necklace* was selected as "The Film of the Year" in the first Canadian Film Awards held in 1949, and has won several international awards. *Brotherhood of Man* won the Grand Prize and Honors at International Film Festivals in Belgium, Venice, Edinburgh, Chicago, and Cleveland. *Animals Unlimited* was accepted for screening in 1951 by the Edinburgh and Venice Film Festivals. *The River* is recognized as a classic documentary film and has won many honors including a first award in the documentary class at the Venice International Exposition of Cinematographic Art.

3. A third limitation is imposed by the paucity of empirical evidence in the form of writings of competent film makers themselves. Most of the important literature on film form can be attributed to a small number of film makers who chose to put their thoughts down on paper. These include classic Russian works by Eisenstein, Pudovkin, and Nilsen; the well-known writings of a few English documentarians, such as Rothena and Grierson, and a few scattered works by French and American authors.

4. A fourth limitation is the lack of experimental evidence on many important aspects of film production, and the inadequacy of much

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of the existing research. This is simply a reflection of the fact that
the systematic study of educational film design is a relatively new
field.

Despite the fact that the evidence is frequently varied and contra-
dictory, and with full recognition of the dynamic quality of the film
experience itself, the writer feels that a satisfactory defense can be
made of an approach which has as its objective the development of a
rational basis for educational film production, and for its method,
an analysis of twenty-one widely accepted films, synthesized with
existing evidence on educational film design.
CHAPTER III
PRODUCERS AND PRODUCTIONS

1. The Producers

Before proceeding to the detailed analysis of specific elements of film design which constitutes the main body of this study, it seems appropriate to introduce the twelve producers and the twenty-one productions about which the investigation is built.¹

Among the producers of educational films specifically designed for schools, two companies are prominent. These are McGraw-Hill Text Films and Encyclopaedia Britannica Films. Each of these companies draws upon the experience of an impressive list of educational specialists, each selects subjects for filming in accordance with the curricular requirements of the schools, and each strives for technical excellence from the viewpoint of photography, sound, and print quality. In addition, these companies make teachers guides available, and work in close cooperation with schools, colleges, universities and educational institutions by direct contact or through participation in audio-visual conferences or other meetings of professional educators.

Encyclopaedia Britannica dominates the list of school films, being the producer or distributor for seven of the nine films mentioned in this group. This company is the successor to Electrical

¹See Appendix A, p. 267.
Research Products, Inc. (ERPI), which began the development of films for education in 1929. It is an affiliate of the University of Chicago, and has produced hundreds of educational subjects.

McGraw-Hill Text Films are predominant in the list of films most used by adults. This production organization, an affiliate of the McGraw-Hill Book Company, produced or released six of the thirteen films listed in the adult category. McGraw-Hill Text Films are characterized by their integration with McGraw-Hill Text Books written by subject-matter specialists who then collaborate on the film version. Human Reproduction, Learning to Understand Children, and Broader Concept of Method, are examples of this type of film. This company is also distributor for RKO Pathe's series, "This Is America"; the National Film Board of Canada's "Mental Mechanisms," and "Mental Symptoms" series; about 80 "March of Time Forum Films"; and serves as an outlet for a number of independent film producers such as the International Film Foundation.

The International Film Foundation, whose film, Boundary Lines appears among the films reported as most used in the adult field, is under the direction of Julien Bryan, documentary film maker and long-time advocate of the use of motion pictures in the schools. His films are built around personal experiences with the subject matter he portrays best—peoples of the world. The result is a combination of Bryan's own social sensitivity and his ability to capture significant symbolic vignettes of life as it is lived in other lands. Boundary Lines, however, is not his own creation, having been undertaken by his staff under the direction of Philip Stapp. This film is
in a much different, more highly symbolic, artistically unique style than typical I.F.F. productions such as *Sampan Family*, *Artisans of Florence*, *Scottish Miner*, and other Bryan documentaries.

The American documentary film movement is also represented by Pare Lorentz, through one of the acknowledged documentary classics of all time—*The River*. This picture is the only one found in both the school and adult film lists. It also heads the combined list of most requested films. Lorentz is personally responsible for this picture, having written and directed it for the Farm Security Administration during the days of the short-lived U.S. Film Service of the Roosevelt Administration.

*Angry Boy* was written and produced by Irving Jacoby, and directed by Alexander Hammid, both of the documentary school. Their organization, *Affiliated Film Producers*, is notable for sensitive and often poetic handling of social problems in such films as *Steeltown*, *Valleytown*, *Journey Into Medicine*, and others.

Government sponsorship of film production is reflected not only by *The River* but also in *Preface to a Life*, produced for the United States Public Health Service, by Sun Dial Films. The National Film Board of Canada produced *Overdependency* and *Feeling of Hostility*, both of which are distributed by McGraw-Hill. The Canadian-produced films show the documentary influence of John Grierson, and are characterised by great realism and concern with personal and social problems.

*Crawley Films*, Limited, of Ottawa, whose films, *Children's Emotions*, and *The Lion's Necklace*, are included in the list, produces films for industry, government, education, and television. The sub-
ject matter of these films shows a diversity which is reflected in their distribution. *Children's Emotions* is distributed by Encyclopaedia Britannica, and *The Loon's Necklace* was produced for McGraw-Hill.

*Brotherhood of Man* was produced for the United Auto Workers-CIO by United Productions of America (UPA) whose staff of experienced Hollywood film makers at one time included Ring Lardner, Jr., who won an Academy Award for his work on the original screenplay, *Woman of the Year*, Maurice Rapf, writer for Disney, and John Hubley and Phil Eastman, both with long experience in the field of the animated cartoon. United Productions of America is well known for the creation of *Gerald McBoing-Boing*, which won an Academy Award as the best cartoon of 1950.

*Land of Liberty* was made available to the schools through Teaching Films Custodians, and was originally released through theatrical outlets by Metro-Goldwyn-Mayer. It was sponsored by the Motion Picture Producers and Distributors of America, Inc., and contains scenes or sequences from 112 different features, shorts, and newsreels from nearly every major studio in the industry. It was edited by Cecil B. DeMille, with James T. Shotwell as historical consultant, and produced as a contribution of the motion picture industry to the defense effort, with rental receipts beyond the cost of distribution going to war emergency welfare work.

*Amercia the Beautiful*, was likewise produced as a public service by Hollywood. It was made by Warner Brothers Pictures, Inc., for the U. S. Treasury Department. Produced by Gordon Hollingshead, it was
exhibited theatrically, and was distributed in 16mm by the Savings Bonds Division of the Treasury Department on a free loan basis.

Reviewing the producers of the films on the "most used" list, therefore, we find Encyclopaedia Britannica and McGraw-Hill, as professional makers of films for school use, leading the list. The documentary film makers are well represented through Julien Bryan, Pare Lorentz, Willard Van Dyke, and Irving Jacoby. Crawley Films, and Sun Dial, Audio-Productions, Inc. (Human Reproduction), and D.P.M. Productions (Animals Unlimited), are independent commercial producers making films for business, industry, and education. Finally, Hollywood producers are represented through two films made as public relations gestures by M.G.M. and Warners, respectively, and by United Productions of America, which is now producing theatrical cartoon films.

2. The Productions

A general view of the productions on the school film list shows that nearly 60 per cent of them are more than ten years old.

Three films (Adventures of Bunny Rabbit, The River, and Farm Animals) are seventeen years old. One (GraySquirrel) is sixteen years old. Two (Colonial Children and Land of Liberty) are fifteen years old. Common Animals of the Woods is ten years old. Autumn on the Farm is six years old. The most recent film in the group is The Loon's Necklace, which is five years old, being produced in 1949.

In the adult films list, all except one are less than eight years old. The River is the oldest films on this list, all the rest being
of relatively recent origin. Two (America the Beautiful and
Brotherhood of Man) are eight years old. Learning to Understand
Children, Human Reproduction, Broader Concept of Method, and Boundary
Lines are seven years old. Overdependency is five years old. Three
films (Preface to a Life, Children's Emotions, and Animals Unlimited)
are four years old. The most recent film reported in either class
is Angry Boy, which was produced in 1951.

The fact that most of these films are at least ten years old
seems "to indicate a preference for the tried and true, and possibly
a reluctance on the part of teachers to experiment with newer films,"
according to the interpretation in the Educational Film Library
Association report. 2

The age of these productions also may be accounted for by the
fact that educational films are typically slow in finding their way
into school and college film libraries because of budget limitations,
and because of the fact that the limited number of prints generally
available for any one subject causes booking difficulties.

The good film normally sells only about 500 prints over a two-
year period, according to Albert J. Rosenberg, Manager of McGraw-
Hill Text Film Department. 3

It is apparent, however, that the films on the Educational Film
Library List are ones which meet broad subject-matter needs. They

2 EFLA Bulletin, loc. cit.
3 Rosenberg, Albert J. In a personal letter to the writer, July 6, 1955.
are "educational" in the terms set forth in Chapter I of this study, rather than narrowly "instructional." There are, for example, no specific skills films, no "how-to-do-its" on the list. These are films which have met with success in interesting large groups of teachers and learners.

The fact that they are teacher-selected is no evidence of their effectiveness with the students themselves. We do, however, have some assurance of close similarity between teachers' ratings of films and those of students through a study undertaken by the Committee on Motion Pictures in Education of the American Council on Education, in which 92 per cent of the students rated films within one point of the ratings assigned the same films by their teachers.4

The school films are distinguished by the fact that they are mostly in the primary area. The animal theme dominates this group, six out of nine films listed as most used by the schools dealing with this subject (Adventures of Bunny Rabbit, Gray Squirrel, The Loon's Necklace, Autumn on the Farm, Common Animals of the Woods, Farm Animals).

Colonial Children, together with most of the films mentioned above, is designed for the elementary level, but it must be assumed that Land of Liberty, The River, and possibly The Loon's Necklace are requested for use in the high school.

The adult films reflect a current interest of the older age groups with family and personal problems, and represent a trend in

educational film production towards dramatic or semi-dramatic presentations on human relations themes.

Ten of the thirteen films listed are based on such themes (Preface to a Life, Children's Emotions, Overdependency, Feeling of Hostility, Angry Boy, Human Reproduction, Learning to Understand Children, Broader Concept of Method, Brotherhood of Man, and Boundary Lines). The River, of course, is a problem-situation, too, dealing not with man's conflict with himself, but with his conflict with Nature.

The adult films, therefore, are strongly oriented towards the changing of attitudes. They attempt to influence the opinions of viewers through a dramatic or semi-dramatic emotional approach. This is true even in the case of America the Beautiful, which is designed to sharpen one's appreciation for his country to the point where he will invest in U.S. Savings Bonds, and with the film, Animals Unlimited, which was produced to encourage the tourist to come to Kruger National Park in the Union of South Africa.

A brief description of each of the films included in this study is found in Appendix A.

Now let us turn to a consideration of the specific rhetorical characteristics of these motion pictures.
CHAPTER IV

ORGANIZATIONAL FACTORS

1. Evidence from the Present Study

To be "educational" an experience must be not only understandable and interesting, but also memorable as well. Vividness, clarity, and emotional involvement are some of the factors which make for memorability. In addition, however, the way a film maker or a teacher organizes his material may determine the effectiveness of the presentation. "Remembering material is in large part a matter of organizing it," says Hollingworth,\(^1\) or, as Adam puts it: "Learning is primarily the organization of multifarious sense impressions into logical and practical patterns."\(^2\)

Among the basic organizational factors which merit consideration in relation to educational film production are: (a) film length, (b) introductions and summaries, and (c) repetition. In the present study an analysis was made of twenty-one widely used educational films to see how and to what extent they are designed with respect to each of these factors.

(a) Film Length. With regard to film length, the school films on the Educational Film Library Association list average a total of approxi-


mately 502 feet, or a running time of 15 minutes. Seven of the nine school films are one-reel (10-11 minutes) in length. The River is a three-reel film (30 minutes). Land of Liberty was designed for theatrical release, and in its entirety has a running time of 85 minutes. However, for non-theatrical purposes, the picture has been broken down into four two-reel segments with running times ranging between 19 and 23 minutes each.

The adult films on the EFLA list are longer than the school films, averaging a total of 795 feet, or a running time of 22 minutes. Obviously, film length is closely related to rate of presentation, or pace. Short films are often packed with too much information. The commentary may be too fast, and the scenes too short. This, in the past, has been one of the most common criticisms of instructional films by students.

An analysis of the rate of delivery of picture cues in terms of scene length, shows that the school films average 92 scenes per reel, with an average scene length of 4.1 feet, or an average screen time of about seven seconds.

The adult films have a somewhat slower visual pacing, having an average of 76 scenes per reel, and an average scene length of 6.0 feet, or an average screen time of ten seconds. Dialogue pictures

See Appendix B, p. 274.

Hoban. Focus on Learning, op. cit., p. 144.

A "scene" is here considered to be a continuous filmic record of a single element or segment of action, and is used synonymously with the term "shot." See Appendix B, p. 274.
tend to increase the length of any given scene, accounting, in part, for the longer scenes found in the adult films where dialogue is used extensively. Also, there is naturally a great range in scene length in any given picture and from picture to picture. Some scenes in *The River*, for example, are less than a foot in length, lasting only a second on the screen, while certain dialogue scenes in *Land of Liberty* (I), run continuously for twenty feet, or approximately thirty-four seconds.

While the greater number of scenes per reel in the school films indicates a somewhat faster visual pacing than in the films on the adult list, it also suggests a richer visual context. Several shots or scenes may be used to express the idea, instead of a single scene. The scale of observations may be changed and the same subject may be seen from a variety of points of view. For example, in *Adventures of Bunny Rabbit*, several relatively short scenes are used to develop a single action of Bunny Rabbit. In this respect, a count of the average number of scenes and average scene length per reel of film does not give a completely accurate picture of the visual rate of development. It would appear, however, that the use of dialogue tends to reduce the richness of visual variety, and perhaps slows the visual pacing. The use of dialogue may also encourage the production of longer films.

(b) **Introductions and Summaries.** Turning to a second structural feature, we find little formal use of introductions and summaries in the films on the Educational Film Library Association list, if we
define an "introduction" as a sequence at the beginning of a film which tells us what we are to see, and a "summary" as a recapitulation of the important points made in the film.

A title prologue to The Loon's Necklace gives us a specific bit of information:

The masks in which the characters appear, carved many years ago by the Indians of the British Columbia coast for use in their winter ceremonies and rituals, are from a collection of the National Museum of Canada.

A title prologue to The River establishes "set":

This is the story of a river;  
A record of the Mississippi  
Where it comes from, where it goes;  
What it has meant to us...  
And what it has cost us...

A summary statement in the narration of Common Animals of the Woods serves primarily as a "neat" verbal conclusions

Today we have watched many interesting animals at work and at play. We have learned of their habits and of their homes, hidden away among the trees and shadows of the deep, quiet woods.

The three examples mentioned above are the only introductions or summaries found among the list of school films. Only The River includes an introduction which clearly points out the purpose of the film, preparing the audience for what is to come.

With respect to the school films, introductions and summaries of the film experience are left to the teacher, a fact which becomes apparent upon examination of teachers guides issued for these films.6

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6 See Appendix C, p. 275.
Among the films on the adult list, we find a statement near the beginning of Learning to Understand Children (I) to the effect that "...this is the story of a child who was different." The opening line of Boundary Lines is: "This is a film about the imaginary lines which divide us as people, from each other." The narrator in The Broader Concept of Method opens the picture with the statement: "The lesson-hearing type of recitation is still widely used in the schools of the nation. Just how valuable a method is this, anyway?"

These generalized introductions possibly serve to orient the audience and establish "set," or anticipation. In none of the films is there a specific listing of content in the introduction.

Only one film on the adult list includes a summary. In The Feeling of Hostility, the conclusion of the dramatized portion of the film is followed by a title which reads: "Now for some points about The Feeling of Hostility." This title, in turn, is followed by a synchronous talk by an "expert," who, speaking directly to the audience, recapitulates the main points of the film.

In a list of twenty-one widely used school and adult films, therefore, only four have formal introductions which set forth the main idea of the film (The River, Learning to Understand Children (I), Boundary Lines, and Broader Concept of Method (I). Only two films in the list include summaries (Common Animals of the Woods, and The Feeling of Hostility).
(c) **Repetition.** Repetition is a structural factor related to the introduction and the summary. In a motion picture, an idea or fact may be repeated visually, verbally, or musically.

In *Human Reproduction*, an animated scene of the menstrual cycle is repeated several times for emphasis. In *Angry Boy*, whole scenes are repeated as the meaning of the human relations involved is intellectualized in the narration.

In *Farm Animals* a numerical concept is repeated verbally, as in the following section of the script:

**SCENES**

10. Farmer Milks Cow.  

**NARRATION**

The farmer takes the pail full of milk to the dairy room where he hangs it on the scales to weigh it. Twenty-eight pounds! Twenty and eight. Twenty-eight pounds. A lot of milk for one cow at one milking.

Repetition is one of the most characteristic structural elements of *The River*. It is used extensively in the free verse narration, contributing both to the rhythmic tone of the film, and to the emphasis of certain key ideas:

We built a dyke a thousand miles long.  
Men and mules; mules and mud;  
Mules and mud a thousand miles up the Mississippi.

We built a hundred cities and a thousand towns but at what a cost.  
We cut the top off the Alleghanies and sent it down the river.  
We cut the top off Minnesota and sent it down the river.  
We cut the top off Wisconsin and sent it down the river.  
We left the mountains and the hills slashed and burned, and moved on.
In *Boundary Lines*, the key idea phrased at the beginning of the film: "What is a line, anyway...Except what we make it?", is repeated at the conclusion: "What is a boundary line, anyway...Except what we make it?"

A repetition of another form is found in *Gray Squirrel*. Here, the narration repeats what is shown visually, describing what appears to be evident from the screen, as in the following excerpts from the script:

<table>
<thead>
<tr>
<th>SCENES</th>
<th>NARRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Nest in tree.</td>
<td>What is this pile of leaves in the tree?</td>
</tr>
<tr>
<td>22. Approaching the nest.</td>
<td>Mrs. Squirrel climbs towards it.</td>
</tr>
<tr>
<td>23. Carries a twig to the nest.</td>
<td>It is a summer home Mrs. Squirrel is building of leaves and twigs. A summer home high up in the tree.</td>
</tr>
<tr>
<td>24. Leaves the nest.</td>
<td>High up where the air is cool and fresh.</td>
</tr>
<tr>
<td>25. She enters and leaves the nest.</td>
<td>High up where the baby squirrels can play among the branches.</td>
</tr>
<tr>
<td>26. Mother jumps up to branch.</td>
<td>More twigs, more leaves.</td>
</tr>
<tr>
<td>27. Mother jumps into nest.</td>
<td>And still more twigs to build a summer home for her baby squirrels.</td>
</tr>
<tr>
<td>28. Mother falls through bottom.</td>
<td>She almost fell through the nest. But she will soon repair that.</td>
</tr>
</tbody>
</table>

Here is an example of "vertical reinforcement," or repetition of the visual content by verbal descriptions of the action. Such repetition may help younger viewers to "see" the picture as a group by calling attention to the key meaning of each scene. It leaves little to the imagination, but rather seeks to interpret the picture even though
the action may appear obvious to the adult observer. Since it appears that children learn to "read" pictures, it is interesting to speculate on the role played by a film like *Gray Squirrel*, in teaching not only subject matter, but also the very technique of "seeing motion pictures." Very little is known about film illiteracy and how the "language" of the motion picture is learned. This field has yet to be explored, using either young children, or unsophisticated adult audiences with no previous film experience. Repeated film experiences naturally acquaint the viewer with the medium, but in addition, certain ways of organizing the content of an educational motion picture might hasten film literacy.

An analysis of four structural factors in twenty-one widely used educational films, shows the school films to be somewhat shorter than the films for adult use, containing more scenes per reel, and being composed of shorter scenes. The school films thus tend to exhibit a greater number of short visual cues than the films intended for adults. Introductions are found in only four films in the list of twenty-one, and summaries only in two. Repetition in several forms is found in six of the films.

In general, these structural factors may be useful to reinforce the factual content, organize information, orient the audience, and simplify the content of the film. In addition, repetition may also serve an aesthetic function, as in the case of *The River*, where the repetition of an idea in free verse form adds tonal quality to the presentation.
Let us turn now to the empirical (i.e. non-experimental) evidence on film length, introduction, summaries, and repetition as elements in the motion picture communiqué.

2. Empirical Evidence

Practically, the length of a film is determined by many factors. First, the expense involved in making films of great length, and the correspondingly higher cost per print tends to limit the sale, and consequently the production of such films, especially in the educational field. Screen time is also a factor. If teachers are to observe the conditions of good film usage, the picture must be short enough to be shown well within the limits of a class hour with enough time for introductory and follow-up activities. Another factor is the amount of factual content, or the number of ideas put forth in the film, and the associated factor of density, or complexity of the ideas advanced. Also, the range of human attention fluctuates greatly, and appears to be distinctly limited. This makes it advisable, especially with children to keep any presentation relatively short.

The learning obligation associated with the teaching film puts a limit on how much can be said, and consequently on the length of the film itself. While the average theatrical film, therefore, usually runs 80 to 90 minutes, the non-theatrical film is much shorter. For example, the length of the average promotional or business advertising film dropped from 25.2 minutes to 23.1 minutes between January, 1949,
and March, 1950, according to a recent survey. In their 1952-1953 catalogues, McGraw-Hill, Encyclopaedia Britannica, Young America, and Coronet, leading producers of educational films, list a preponderance of one-reel films of 9 to 12 minutes in length. Ten of the twenty-one widely used educational films examined in the present study are approximately one-reel in length, seven of these films being designed for use at the school level.

A considerable amount of experimental evidence exists on the effectiveness of introductions and summaries in teaching films, some of which will be referred to in the following section. Speakers and writers have also given such consideration to these organizational elements, and the consensus seems to be that the introduction and the summary are both important to the success of the communication whose purpose is primarily informational.

Speeches, as teachers on this subject have long reminded us, should have at least three well-defined divisions: the beginning or introduction, the main body or development, and the ending or conclusion.

The creation of good will for the speaker and his thinking is the aim of the introduction. The successive marshalling of the ideas to be implanted is the work of the main body. The final effort to consolidate these impressions makes up the conclusion.

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8 See Appendix D, p. 279.
In his chapter on "The Trouble with Textbooks," Rudolph Flesch, quoting Thomas H. Briggs, says: "Professor Briggs thinks a textbook author should in each unit tell what he is going to tell, tell it, and tell what he has told." Flesch agrees with this structure as a device for gaining reader understanding and promoting memorability, and points out that Dale Carnegie uses the introduction and summary for each section and chapter, and for his book as a whole.

The introduction and the summary are commonly employed by the classroom teacher, and it is unnecessary to belabor the empirical evidence on this point.

The same is true for repetition, a technique widely used in teaching, advertising, and propaganda. For these purposes, repetition may serve two major functions as suggested by Doobs:

Repetition as a perceptual device increases the probability that the situation will be perceived. Thus the identical statement may appear many times within the same book issued by a propagandist; the reader who skims over or who fails to comprehend the section in which the statement occurs the first time, consequently, may perceive it the second, third, or fourth time. Repetition in this sense, then, implies only the initial perception. Repetition, moreover, may also be employed to influence people who have already perceived the propagandist's stimulus-situation; in this connection, however, the process has not a perceptual but a reinforcing function.

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11 *Loc. cit.*
To bring the empirical evidence down to the motion picture, Eisenstein also distinguishes two functions of repetition, although these are somewhat different than the functions suggested by Doob:

One function is to facilitate the creation of an organic whole.

Another function of repetition is to serve as a means of developing...mounting intensity...We need not seek far for examples of both these functions. Both may be found in films.

The first function is found in operation in Potemkin—in the repetition of "Brothers!" first occurring on the quarter-deck before the marines refuse to fire; next not as a sub-title but as the sequence of the sail-boats that merge shore and ship, and last, again as a sub-title, "Brothers!" when the squadron permits the Potemkin to pass unattacked.

Alexander Nevsky contains an example of the second function of repetition—mounting intensity. Instead of repeating a single measure of the music four times as written in the score, I multiplied this by three, achieving twelve exact repeats of the measure. This occurs in the sequence where the peasant militia cuts into the rear of the German wedge. The resultant effect of growing excitement never fails to win the spectators' approval.13

In assembling the empirical evidence, we find that repetition may serve to (1) capture attention, increasing the probability that the situation will be perceived, (2) reinforce learning and improve retention, (3) serve as a method of unifying a presentation and giving it structural unity, and (4) may have an emotional impact, or result in mounting intensity through the repeated use of pictorial, verbal, or music symbols.

Finally, in discussing the role of repetition in propaganda, Doob points out that the skillful propagandist does not simply repeat the stimulus in its original form, but varies it to arouse related attitudes. 14

Now let us examine some of the experimental evidence on film length, introductions, summaries, and repetition.

3. Experimental Evidence

Experimental studies of film length are related to (a) the amount of factual content included, and to (b) the rate at which this content is developed. These studies show, in general, the desirability of not overloading the teaching film with factual content, and of a rather slow rate of development.

Roshal, for example, noticed that experimental films designed to test the effectiveness of participation in learning knot-tying, moved too fast to allow sufficient time for the learners to actually tie the knots as shown on the screen. 15

Jaspen, following up Roshal's finding, showed that with experimental versions of a film on breechblock assembly, a slow rate of development with audience participation was superior to a rapid rate of development with audience participation, the difference being reliable at better than the one per cent level of confidence. The "succinct treatment" of a three-minute film presentation of the

14 Doob, op. cit., p. 137.
15 Roshal, loc. cit.
assembly and disassembly of a breech-block mechanism proved to be the least effective of fourteen versions used in Jaspen's experiment.\(^6\)

Fact density and film length was also explored by Vincent, Ash, and Greenhill. Using four versions of a film on the weather, with commentaries of equal verbal difficulty as measured by the Dale-Chall Readability Formula, the investigators tried to measure the effectiveness of: (1) a 30-minute presentation with heavy factual content, (2) a 30-minute presentation with half the number of facts included in the heavy version, (3) a 15-minute presentation with heavy factual content, and (4) a 15-minute presentation with half the factual content of the heavy versions.

The results were not conclusive, partially due to lack of interest on the part of the experimental population which consisted of 324 college students, 434 high school students, and 503 Air Force trainees. The investigators concluded, however, that:

...the data suggest that, as more and more information is presented, interferences are set up that result in less efficient learning of any particular part... (and that)...it seems clear that packing more and more information into a film yields only very slight increments in total measured learning.\(^7\)

When taken together with some of the practical limitations of film length, the experimental evidence strongly suggests the production of shorter films with a thorough development of a few big ideas, and relatively light factual content.

\(^6\)Jaspen, loc. cit.

Related to the apparent desirability of "desaturated" factual content and slower rates of development, experimental evidence points to the desirability of well constructed introductions and summaries in instructional films.

The introduction of a film by the teacher, and the use of a summary discussion or other reinforcing activity following the showing, are accepted and widely practiced procedures. Experimental evidence also suggests the effectiveness of such practices in increasing learning from films. 18

In addition, two studies have been conducted as part of the Instructional Film Research Program, to measure the effect of introductions and summaries when these are built into the film itself.

In one of these studies, Lathrop used the films Sulphur and Its Compounds, Mammals of the Rocky Mountains, and Rivers of the Pacific Slope, showing each film twice—once with the introduction included, once with the introduction deleted. With an experimental population of 500 ninth-grade students, the film versions with the introductions included proved slightly superior in the case of Sulphur and Its Compounds (plus 1.14 points reliable at the six per cent level of confidence), and Rivers of the Pacific Slope (plus 1.31 points, reliable on the one per cent level of confidence). However, Mammals of the Rocky Mountains was found to be superior in the version which did not in-

18 Wittich, and Fowlkes, loc. cit.
Howland, Lumsdaine, and Sheffield, loc. cit.
Research Report No. 4: The Effective Use of Sound Films, loc. cit.
clude the film introduction (plus 2.55 points at the 0.2 per cent level of confidence).

Norford did a similar study on the effect of summaries included in three films, using an experimental population of 561 ninth-grade pupils, finding very small differences in favor of the versions which included a film summary, only one of which, however, was reliable at better than the five per cent level of confidence.

These two studies suggest the desirability of the introduction and the summary when these are designed to reinforce the message of the film. Lathrop's study indicates that in some cases, a weak or irrelevant introduction may set up interferences with the learning of material which follows.

In evaluating these experiments, a report on the Instructional Research Film Program states:

Presumably two psychological principles of learning are involved in film introductions and summaries: (1) orienting the audience by pointing out the importance of the material to be learned and its relation to previous learning, and motivating the audience to learn it, and (2) repeating major concepts in the introduction, the body of the film, and the summary. If this is so, introductions and summaries are special applications of the elements of involvement and repetition.


21 Instructional Film Research, 1918-1960. op. cit., Chap. 8, p. 31.
Introductions and summaries may also be related to primacy and recency. Summarizing laboratory findings on the operation of primacy and recency in memory material, Burtt says:

If the subject learns a list of words, the earlier and later portions are learned more readily than those in the intermediate positions. When a white rat is learning to find his way through a maze, it is the initial and final portions that are learned most quickly.\(^{22}\)

Experiments with magazine advertising also show that advertisements in the front and back parts of a magazine tend to receive more attention and result in a higher rate of recall than those in the middle of the publication.\(^{23}\)

As already pointed out, the introduction and the summary are related to the factor of repetition.

A number of experiments show that learning from films is improved with repeated showings.\(^{24}\) McTavish, studying the effect of repetitive showings, found that "for factual films of the kind used in this study, showing them twice results in appreciably more learn-

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\(^{23}\) Ibid., pp. 208-213.

\(^{24}\) Rulon, loc. cit.


Yale Motion Picture Research Project, loc. cit.

ing showings after the first two contribute little more to learning, and the drop-off is very rapid."  

However, we are interested here in repetition as a factor in the film structure itself. The research on this point, although it appears to be limited to a single study, tends to confirm the effectiveness of repetition in improving learning from film.

In this study, Jaspen developed experimental film versions in which he included a sequence on the assembly of the breechblock once, twice, three times, and four times. These repetitions were slightly different, having been taken from somewhat different camera angles and the repetitious sequences having been edited at a somewhat faster rate than the initial presentation. The findings showed the version including four repetitions to be the best in terms of teaching perceptual-motor skills, although it appeared to "drag." 

Commenting on this and related experiments, a report of the Instructional Film Research Program concludes:

Although repetition may be distasteful to instructional film producers from an aesthetic, artistic, or filmic point of view, and may be contrary to the prevailing practice of producing films to amuse an audience, the experimental fact seems to be that repetition in a film or of a film is a major factor of instructional effectiveness.  

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26 Jaspen, loc. cit.
27 Instructional Film Research 1918-1950, op. cit., Ch. 29, p. 50.
In this report, the advisability of including the repetition in the film itself is suggested because of complications in conditions of showing which may preclude repeated exhibition, and it is pointed out that:

From a production point of view, repetition within the film involves little additional time or expense. There is room for considerable imagination when using repetition in films to avoid stereotyped patterns of production.28

The factor of variation in repetition has also been found to be of some importance in the field of advertising. Adams, using dummy magazine advertisements, found that four repetitions of the same ad were only 2.6 times as effective as a single appearance of the ad. When the content of the ads was varied, however, the fourth repetition was found to be approximately four times more effective in gaining attention than the single ad alone.29

Jersild, studying modes of emphasis in public speaking, concluded that "the most effective, although not the most economical, form of emphasis is repetition to the extent of three or more presentations," but also pointed out that "the benefit arising from repetition does not increase in proportion to the number of added repetitions."30

Ehrensberger, also investigating forms of emphasis in public speaking, found three scattered repetitions more effective than two,

28 Loc. cit.
but felt that concentrated repetition is best, and that more than three repetitions produces diminishing returns. 31

Burtt points out that repetition has attention value and tends to facilitate memory, but that the effectiveness of repetition, as revealed in many experiments, seems to be approximately proportionate to the cube root of the number of repetitions. The advantage of repetition with variation is also noted. 32

Studies of the influence of repetition on learning from films, together with related findings in the fields of speech and advertising, such as those just mentioned, provide a sound basis for the considered use of repetition in the production of educational films. However, the element of repetition is closely related to the use of introductions and summaries, and to the element of familiarity. Repetition, introductions, and summaries, are, in turn, related to film length and rate of development, each, perhaps, having a dynamic and as yet unmeasured influence on the other.

Summary

Among the organizational factors involved in designing the film for educational purposes are film length, introductions and summaries, and repetition.


An analysis of twenty-one widely used educational films shows that the nine school films in the group average 15 minutes in length, and the thirteen films used by adults average 22 minutes. Only four of the twenty-one films considered include an introduction, and only two contain a summary. In six of the twenty-one films several forms of repetition are found.

It is apparent that film length, introductions and summaries, and repetition are closely related to each other and to other production elements. For example, film length is affected not only by the factor of cost, limitations of showing time, and the span of human attention, but also by the number of ideas in a film, their complexity, and by the rate at which these ideas are developed. Experiments have shown that films with "light" factual content and a slow rate of development are superior to films which are packed too tightly with information and which move too fast. Empirical evidence bears this out.

The rate of development may be slowed by the use of dialogue, the inclusion of introductions and summaries, and repetitions of the same sequence in the same film. These techniques tend to improve retention, but they also imply the production of somewhat longer films as a result. Generally speaking, the simplification of an idea, whether in written, spoken, or film form, means expansion rather than contraction. However, film costs and restricted showing times for classroom purposes considered, we may expect the well-designed educational film to be from ten to twenty minutes in length, and to contain relatively few ideas, or a "light" factual content in terms of its in-
intended audience.

The introduction may reinforce learning by establishing "set," or providing orientation. It may also operate to arouse anticipation to the point where an audience may become emotionally involved. The "open-ended" summary may also provoke an emotional reaction. This aspect will be discussed in Chapter VI on "Audience Involvement."

Introductions and summaries, at any rate, tend to reinforce learning through repetition. The effect of primacy and recency on memory may come into play here, too, especially when the introduction and summary are designed to bring the content of the film into sharp focus. If, on the other hand, the introduction and summary are irrelevant or misleading, they may distract the learner and defeat the purpose of the film communiqué.

Repetition seems to serve several functions in the educational film. It may (1) attract attention, (2) act as an aid to memory, and (3) be used aesthetically to give unity and impact to a presentation, as in The River. In the twenty-one widely used films studied, while it is infrequently used, repetition takes several forms, occurring pictorially, verbally, and musically.

There are apparent limits to continued repetition, one investigator suggesting that effectiveness is diminished in proportion to the cube root of the number of repetitions. Tests using repeated showings of the same film, and experiments on the effectiveness of repetitions included in films themselves, tend to show that two to four repetitions of the same material represents the optimum, and that
it is advisable to vary the form of each repetition. In this connection, Hoban recommends:

There must be a greater variety of scenes and situations relating to the major understandings, appreciations, attitudes, or behavior patterns the films intend to develop, so as to provide a depth and variety of meaning. It is not simple repetition, but repetition in variety that is the "law of learning." Learning is like bathing—a bath is best when there is time for soaking, lathering, and splashing around in the water—not just an in and out dip in the tub under the shower.  

Finally, the evidence on the introduction and summary and on the effect of repetition suggests that these elements be built directly into the organizational pattern of the educational film. This would tend to improve the chances of film effectiveness in those situations where the conditions of use are unfavorable, or where poor or inexperienced teachers are involved, and would place squarely upon the producer the responsibility for designing films which will be understandable, interesting, and memorable as well.

Thus, the evidence indicates that while the twenty-one films included in the present investigation make relatively little use of the structural elements discussed, their effectiveness as teaching tools would possibly have been improved by the inclusion of introductions, summaries, and artful use of repetition.

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33 Hoban. Movies That Teach, op. cit., p. 94.
CHAPTER V

VOCABULARY LEVEL AND RATE OF DELIVERY

1. Evidence from the Present Study

The "understandability" of the spoken commentary of a motion picture is a product of several factors, among which are vocabulary level, sentence length, rate of delivery, repetition, incorporation of human interest, questions, and synthesis of verbal with visual elements.

These occur in combinations which cannot be easily dissected for analysis. However, vocabulary difficulty and rate of verbal delivery can be estimated with some certainty, and these two elements were selected for detailed study.

The feasibility and desirability of using readability formulas in evaluating the difficulty of oral commentary for teaching films has been demonstrated by Chall and Dial, and later by Allen, who found that:

The level of readability at which the oral commentary of factual instructional motion pictures was written had a measurable effect upon the learning of the factual content of the film. Commentary written one grade level below the present grade level of the pupils resulted in significantly greater learning of the material than did commentary written one grade level above. The average gain made by the sixth grade pupils exposed to the

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seventh grade commentary was 8.2 per cent of the possible maximum improvement.²

Correlations between reading ability and amount of learning from Encyclopaedia Britannica films at the fourth-, fifth-, and sixth-grade levels have been reported by Wittich and Fowlkes,³ and fair correlations between reading comprehension and listening comprehension have been found by Goldstein, (.70)⁴ Larsen and Feder (.68),⁵ and by Anderson and Fairbanks (.80).⁶

On the basis of such studies, it seemed reasonable to the writer to investigate the vocabulary level of the twenty-one widely used educational films listed in the EFLA survey to see to what degree they matched the grade-level or levels for which they were intended.

Samples of 100 words each were taken from the beginning and end of each reel of film (i.e. each 400-foot unit), with two samples chosen randomly in between. This amounted to a total of four 100-word samples for each reel of film. Additional samples were taken where synchronous dialogue was involved to get some indication of the


³Wittich and Fowlkes, loc. cit.

⁴Goldstein, H. Reading and Listening Comprehension at Various Controlled Rates. Contributions to Education, No. 821, New York: Teachers College, Columbia University, 1940.


relative difficulty of dialogue vs. narrated sequences. All samples were then analyzed using the Dale-Chall Formula for Predicting Readability.7

On this basis, the average vocabulary level of the films in the school film list was found to be between the fifth- and sixth-grades. Excluding Land of Liberty, which was near the eighth-grade level and originally intended for general theatrical release, and The River, which was near the ninth-grade level, and also originally intended for general adult audiences, the average grade-level of the remaining films, most of which had been designed for the elementary level, was found to be at grade four.8

The adult-level films as a group, averaged at between the seventh and eighth-grade levels. This average was raised by The River, which, as previously noted, was near the ninth-grade level. Five adult films in the list of thirteen, were found to be between the fifth- and sixth-grade levels. Five were between the sixth- and seventh-grade levels. One film, Angry Boy, was at the fourth-grade level. This is accounted for in part by the fact that this film contains mostly dialogue, averaging only about 8.5 words per sentence in comparison with a total sentence length of 15.2 words per sentence for all films in both adult- and school-lists.

Only two films in the school film list contained synchronous

8 See Appendix E, p. 280.
dialogue (Colonial Children, and Land of Liberty). All except four films in the adult-list made use of synchronous dialogue, although in some cases there was only a line or two. Insufficient evidence precludes any generalizations regarding the comparative difficulty of narration vs. dialogue in the films examined, except to suggest that dialogue sentences appeared to be shorter than narrative portions as, for example, in Angry Boy, where we find a telephone conversation between a mother and a school principal:

Mother: Yes, Mr. Kerns, this is Mrs. Randall...Is he hurt?
Kerns: ...But I'm afraid that my business is unpleasant. I'm sorry to say that your Tommy has been caught stealing. Money. From Miss Perkins' pocketbook.
Mother: Oh, but that's impossible. I'm sure it's impossible. There must be some mistake. You've got the wrong child!
Kerns: I'm afraid there's no room for doubt. Miss Perkins caught him in the very act.
Mother: You mean she actually saw him? Oh, I can hardly believe that!
Kerns: I know. I don't like to believe it myself. But we've been missing things around here for some time--little things. And now there's this matter of a bracelet. Have you, by any chance, missed a gold bracelet?

Another example of the brevity of dialogue is found in the film, Overdependency, involving a conversation between an immature, indecisive husband and his wife:

James: What tie should I wear, Marian?...My grey suit.
Marian: I'll help you with one, dear. This one will be fine, dear.
James: Thanks, Marian.
Marian: Better hurry! You'll be late!
James: Where's my wallet?
Marian: Did you look in all your pockets?
James: Certainly!
Marian: Did you look in your other suit?
James: Of course!
Marian: Oh, Jimmy!
Jimmy: Oh, come on! Let's go!
Human Reproduction tested as the most difficult commentary of all films considered, due, in part, to the number of technical and anatomical references used:

Narrator: The ovary is a gland in which eggs are constantly being formed. Each almond-shaped ovary is about an inch and a half in length. Besides producing eggs, these glands secrete fluids into the blood which are responsible for the development of female characteristics in other parts of the body, such as breasts, hair, and skin. But, from puberty on, the primary function of the ovaries is the production of eggs.

The River, at about the ninth-grade level, is characterized by the use of proper names, repetition, alliteration, and the free-verse style:

From as far West as Idaho,  
    Down from the glacier peaks of the Rockies—
From as far East as New York,  
    Down from the turkey ridges of the Alleghenies—
Down from Minnesota, twenty-five hundred miles,  
    The Mississippi River runs to the Gulf.
Carrying every drop of water, that flows down two-thirds the continent,  
    Carrying every brook and rill,  
    Rivulet and creek,  
    Carrying all the rivers that run down two-thirds the continent,  
    The Mississippi runs to the Gulf of Mexico.
Down the Yellowstone, the Milk, the White and Cheyenne;  
The Cannonball, the Musselshell, the James and the Sioux;  
Down the Judith, the Grand, the Osage, and the Platte,  
The Skunk, the Salt, the Black, and the Minnesota;  
Down the Rock, the Illinois, and the Kankakee  
The Allegheny, the Monongahela, Kanawha, and the Muskingum;  
Down the Miami, the Wabash, the Licking and the Green  
The Cumberland, the Kentucky, and the Tennessee—
    Down the Ouchita, the Wichita, the Red, and Ysaco.  
    Down the Missouri three thousand miles from the Rockies;  
        Down the Ohio a thousand miles from the Alleghenies;  
    Down the Arkansas fifteen hundred miles from the Great Divide;—
        Down the Red, a thousand miles from Texas—
    Down the great Valley, twenty-five hundred miles from Minnesota  
        Carrying every rivulet and brook, creek and rill,  
        Carrying all the rivers that run down two-thirds the continent—
    The Mississippi runs to the Gulf.
A variety of literary styles is at once apparent in the films under consideration, each adapted to its intended purpose, each designed within the framework of the presentation as a whole. Compare, for example, the emotional tone of the commentary from *The River* with the simple, expository treatment of *Adventures of Bunny Rabbit*.

This hole in the ground is the front doorway of Mrs. Gray Rabbit's home—deep in the woods. Inside the hole, under the ground, hidden under a soft blanket of fur, are Mrs. Bunny Rabbit's very young children. Bunny Rabbit is the first baby rabbit to come out and look for adventure. His fur is quite short. He's only about as big as a baby kitten. His ears are still short and his legs rather wobbly.

In spite of their diversity of treatment, all of the most widely used films in both school and adult lists have commentaries which are relatively simple in vocabulary, averaging between the fifth- and sixth-grade levels, with an average sentence length of 13.2 words.

The rate of delivery, or words per minute of narration or dialogue is of interest in this connection, since even a simple commentary may be difficult to understand if read too fast or too slow.

To measure the approximate rate of delivery, each film was run on a projector previously checked for accuracy in timing by clocking a 400-foot reel of blank leader on a footage counter, punching a hole at 36-foot (one minute) intervals, then timing the punch mark with a stop-watch during projection.

The test samples of narration used for the Dale-Chall Readability analysis were similarly timed in projection. Samples totalling at least four minutes of running time were clocked out of each 10-minute reel. The result is an index which shows the average verbal rate of the school films to be 123 words per minute, and that of the adult
films 118 words per minute. The total average rate of verbal delivery for all films examined is 120.5 words per minute.

These results are obviously not completely reliable, since there are often different rates of delivery in the same film, and because dialogue is often delivered at a somewhat slower rate than narration. The latter fact appeared to influence the rate of verbal delivery in films like Feeling of Hostility, and Overdependency.

2. Empirical Evidence

Motion picture writers do not make vocabulary studies before preparing narration or dialogue. Film writing, like other literary efforts, is considered to be a creative act.

Nevertheless, there are principles of film writing, widely agreed upon by writers of both educational and entertainment films. One of these principles is that what is said is seldom as important as what is shown on the screen. Another principle is that the verbal should never conflict or contradict the visual, except for special effects such as might be desired in comedy, and that it should, in most cases, be closely synchronized with the visual. A third principle is that narration should be used sparingly, only to point up or emphasize the content of the visual. The "overloaded" track, it is agreed, makes for an illustrated lecture; defeats the visual element, and reduces the effectiveness of the film.

Practical film makers, although they might not be willing to apply readability formulas to their commentaries, nevertheless recognize the value of short sentences, of conciseness and brevity in the verbal portion of the presentation. Clara Beranger, writer for
Paramount, and M.G.M., for example, advises the writer of motion picture dialogue:

Don't try to be literary or flowery. Flourishes sound pompous and stilted on the screen.

Don't over-write, as there is neither the space nor the time in a film for too much talk.

Don't use meaningless or unrevealing words. 9

And in The Aperture, a workshop publication for 16mm film producers, we find the same awareness of the need for simplicity in screenwriting:

Keep sentences short—avoid multiple clauses.
A sentence that wanders from clause to clause is often hard to follow in type—it is almost impossible to follow by ear. 10

Implied or stated in the thinking of all practical film makers is the belief in the primacy of visual over verbal thinking, a belief which encourages the use of short sentences and lean narration in film-writing.

Since screen dialogue is to be heard and not read, words must be selected which will be easy to speak and to listen to. "Good dialogue speaks, bad dialogue reads." 11

The proper relationship of picture and sound in a film has been compared to that of the parts in a musical duet; neither part of the duet is complete in itself, but played together they combine to produce a complete composition. It should be noted, however, that in the case of the film, the two parts are generally not of

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11 Beranger, op. cit., pp. 122-123.
equal importance. Normally, the visual part of a sound film is the more important in the sense that it carries more of the total significance. This is hardly surprising; sight after all is the most important of our senses, and we know and learn far more of the world around us through our eyes than through our ears. This fact has a bearing particularly on the use of dialogue in the sound film...There is generally no justification for allowing speech to play more than a subordinate part; even on the sound-track it does not rule unchallenged, but must frequently give way to other natural sounds and noises, and to music.12

The assumption of visual primacy by professional film makers, has resulted in a rather widespread agreement that film narration and dialogue must be used sparingly, and that where used it must be brief and to the point. The necessity for verbal simplicity and clarity is noted again and again, especially in more recent writings on educational film production.

The writing of a script for an effective training film requires...incisiveness and straight-line thinking, and with it all, the ability to put it on paper in acceptable English with an economy of words. The writer of a training film script must, of necessity, have a vivid imagination. He must be picture-minded first and word-minded second. In analyzing his subject matter, he must ask himself constantly, "What is the picture at this point that will tell the story in terms of the objective?" and, having determined the picture, he must then ask, "What is the simplest meaningful statement that I can make that will extend the effectiveness of the picture and add to its retention potentiality?" The writer with genuine ability for training film production understands that he is working with a medium in which the primary value is visual and secondary value is auditory. He knows that he is not writing lectures with pictures "to fit," he is organizing pertinent pictures of subject matter in movement, using the fewest possible words to describe, to emphasize, to extend.13

The development of "readability formulas" is of relatively recent origin, and only during the last two or three years have such formulas been applied to film narration. But the use of simple language in films designed for teaching purposes appears to have been a major point of consideration of film makers for some time. As noted in the previous section, teaching films made as early as fifteen or sixteen years ago use vocabularies, which, when analyzed with present day readability formulas, measure out close to the grade level for which they were intended. Even the films in the EFLA list intended for adult audiences, average out at a relatively low level of from between the seventh- and eighth-grades. Three films on the list, originally intended for general theatrical showing, average at the seventh-, eighth-, and ninth-grades, respectively (America the Beautiful, Land of Liberty, The River).

As previously mentioned, rates of delivery in film narration or dialogue tend to vary with different pictures and within the same picture. In some cases, as in Land of Liberty, two narrators with different rates may be used. Scenes of excitement may be amplified by an increased tempo on the part of the narrator, while sequences intended for quiet or pacific effect may be accompanied by a more leisurely reading by the commentator.

As previously noted, the total average rate of verbal delivery of the school-film on the EFLA list is about 123 words per minute, with a range from 90 to 155 words per minute. Five out of the nine films on this list have rates of delivery below 130 words per minute, or below a rate which some speech specialists regard as "normal" speed.
of speech delivery. The total average rate of verbal delivery of the adult-films in the list is 118 words per minute with a range from 75 to 155 words per minute. Ten out of thirteen films in this list have rates of delivery under 130 words per minute.

Empirical evidence thus shows a concern on the part of film makers for simplicity in film-writing, with special emphasis on the necessity for economy in the use of words, simple sentence structure, and respect for the visual as against the verbal element. "Words are not as powerful as pictures. Adjectives cannot fight against visual facts," as one experienced film maker puts it. Simplicity in writing and a relatively slow rate of delivery characterize most of the films in the present study, and it would be interesting to extend the vocabulary and rate of delivery analysis to a larger number of educational and entertainment films.

3. Experimental Evidence

A number of studies have shown the relationship of reading comprehension and listening comprehension. Goldstein found a correlation of .78 between these two types of comprehension using adults between the ages of 18 and 65 as his test group. Similar correlations were found by Anderson and Fairbanks, and Larsen and Feder.

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14 Baird and Knower, op. cit., p. 216.
16 Goldstein, loc. cit.
17 Anderson and Fairbanks, loc. cit.
18 Larsen and Feder, loc. cit.
However, the correlation in these studies, "is still low enough to permit some persons to be much better reading comprehenders than listening comprehenders and vice versa." In the Anderson and Fairbanks study, for example:

The reading vocabulary score correlated more highly with reading comprehension and with intelligence than did the listening vocabulary score. The poorer readers had a larger listening vocabulary than reading vocabulary. This is in line with other studies which have found a considerable number of pupils in the elementary grades whose reading comprehension was a year or more below their listening comprehension.

A way may be found to measure the verbal element of a sound film as it is heard by the audience, not only on the basis of the "readability" of the commentary, but also on "how it listens." In the meantime, the practicability of using existing readability formulas to measure the possible effectiveness of film commentary for any given grade level has been suggested by Park's study, and directly substantiated by the work of Allen.

Using eight sound films at both the elementary and high-school levels, Park measured the effect of vocabulary on comprehension of commentary, and found that a greater amount of learning occurred with films using shorter sentences, and pointed out the importance of easy vocabulary. He tabulated the words in the commentaries of the films in terms of their frequency in Thorndike's *Teachers Word Book*, constructing a pre-test of the more difficult words. The score on this

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test was then correlated with the score of a test based on film content given following the showing. This test showed that those who scored high on the vocabulary pre-test tended to learn more from the film, the correlations centering about .50 for 22 different grade groups. Park found that the mean sentence length of the commentaries varied from 9.71 to 20.35 words, and that a greater amount of learning seemed to take place with those films using shorter sentences.21

Allen's more recent study (1950), measured the relationship between "readability" of film commentary and the amount of factual learning from the film using alternate versions with 638 sixth-grade pupils.

He prepared alternate tape-track commentaries of the Encyclopaedia Britannica films, The Mosquito, and The Water Cycle, and found that "the readability level of the spoken commentary has a definite effect upon the learning of factual information," and that "apparently, the easier the material is, the better it is learned."22

Of interest here, is the fact that in comparing the Lorge, Dale-Chall, and Flesch formulas as devices for measuring film commentary, Allen found that "all the readability formulas were about equal in predicting the comparative readability of film commentaries."23 But in addition to the desirability of vocabulary simplification, he also concluded that learning from sound films could be improved by the

22Allen, op. cit., p. 66.
23Ibid., p. 94.
addition of human interest elements, questions, the use of the imperative, and by "patterning" or enumeration points to be learned in any given film.

Allen's study is interesting in one further respect. It reaffirms the widely-observed fact that simplification in any literary medium, almost always means expansion. In writing experimental narrations for his test films, for example, Allen complains:

An additional problem was present, that of fitting new commentary to visual scenes that had been produced to carry a different commentary. In the original production of an instructional film, the producer achieves a sensitive balance between the "visuials," and the commentary. Ideally, these two elements are expected to complement each other. The difficulty can be readily appreciated, then, when the "frozen" visual material has to be accepted as it is, and new commentary adapted to it, especially when that new commentary must have practically identical content with three other different commentaries. For example, perhaps in the original commentary one long complex sentence, containing several concepts, had accompanied a visual scene of, say, fifteen seconds' duration. When this commentary is simplified, several sentences must be used and complex words must be replaced by several simple words. But the writer is limited to only fifteen seconds in which to make all these changes.24

The inter-locking nature of the elements in motion picture production thus again confounds the research worker and supports the practical film maker's assertion that the artificial isolation of one element from the production as a whole tends, to a large extent, to limit the significance of the findings.

With respect to rate of delivery or rate of verbalization, a number of studies appear in the field of speech and radio. While

24 Ibid., pp. 25-27.
these appear at times contradictory, and while they do not necessarily apply directly to the motion picture, a few of these are of some interest as background here.

In one of the early studies on various modes of public reading, Woolbert found an even rate of delivery better than a broken rate. Dietrich concluded that a conversational delivery is somewhat more effective than dynamic delivery in shifting attitudes as far as radio delivery is concerned, the subjects tending to label the dynamic delivery "propaganda" more often than the conversational delivery.

Nelson, studying the effect of five newscasters in five different newscasts, delivered at five different rates varying from 125 to 225 words per minute, with college freshmen, found that 81 per cent preferred a rate of 175 words per minute. More than 50 per cent indicated that the slowest rate of delivery (125 words per minute) caused them to lose interest, yet they remembered more at this slow rate than at faster rates. Nelson noted some relationship between general intelligence and listening ability, little correlation between reading and listening ability. He found vocabulary level to be important, concluding that:

The difference in the difficulty levels of the newscasts were the only highly significant factor in influencing recall. Flesch's formula revealed that the most

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difficult newscasts differed from the most easily re-called newscast by a full reading grade.27

Few studies on levels of verbalization have been made in the film field, but those which have been made correspond roughly with the conclusion of Nelson, that slower rates, within limits, tend to produce greater amounts of learning.

Jaspen conducted two studies, the first of which was inconclusive.28 The second study involved three rates of delivery developed in alternate film versions designed to teach military trainees the assembly of the breechblock of the 40mm gun.29 The three versions involved rates of delivery at 142, 74, and 45 words per minute, respectively. His conclusion was that:

...The relationship between level of effectiveness of the film and level of verbalization (amount of narration used to describe the action), appears to be curvilinear, with the apex of the curve at the medium level of verbalization (approximately 100 words for each minute of film).30

Another study, undertaken for the Instructional Film Research Program by Zuckerman, was also concerned with levels of verbalization.

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28 Jaspen, Especially Designed Motion Pictures: I. Assembly of the 40mm Breechblock," loc. cit.
30 Ibid., p. 16.
Using experimental versions designed to teach military trainees how to tie the bowline, sheet bend, and Spanish bowline knots, Zuckerman found a medium level of verbalization superior to either high or low rates. 31

These studies tend to confirm the opinion of practical film makers that an "overloaded" track is undesirable. Zuckerman, in this connection, states that:

...Verbal descriptions of acts and relationships assisted the learners, but a very detailed description given within a short time interval interfered with and actually reduced learning. 32

A difference is recognized between what Jaspen and Zuckerman have studied as "rate of verbalization" (number of words used to describe the action), and "rate of delivery" (the rate at which a narrator should deliver his message), reported by students of speech and radio. Yet, in film research these factors appear to be so interrelated as to be comparable. For example, the rate at which a narrator delivers his lines is, in most cases, a product of the amount of script he is required to deliver.

The experimental evidence, taken as a whole, suggests the desirability of simplicity of vocabulary, and a "medium" rate of verbalization and/or delivery, in the order of 100-150 words per


32 Ibid., p. 51.
minute of film. Much more study is obviously needed, especially with films designed to shift attitudes, although the number of variables involved appears to make such studies extremely difficult.

Summary

The understandability of film narration and dialogue is a product of many inter-related factors which are difficult to isolate for study. It appears, however, that at least a part of film effectiveness depends upon clarity and simplicity of language. The importance of conciseness, short sentences, and visual primacy is generally recognized by writers of both entertainment films and educational motion pictures.

Experimentally, we have some evidence of correlation between listening comprehension and reading ability, although some persons will probably always be found to be better listeners than readers, and vice versa. Nevertheless, the usefulness of studies of the vocabularies used in film narration has been strongly suggested in the work of Mittich and Fowlkes, and others. Park and Allen have reaffirmed the importance of simple vocabulary in sound films intended to impart information, Allen having demonstrated the feasibility of using any of three well-known readability formulas to test the grade level of film narration.

When a group of widely used educational films were analyzed using the Dale-Chall formula, the average grade level of nine films intended for school use was found to be between the fifth- and sixth-grade levels. Thirteen adult films were found to have vocabu-
lary averaging at a level between the seventh- and eighth-grades. A total average for all films in both lists showed this group of widely used films to have a vocabulary level at between the fifth- and sixth-grades.

Sentences were relatively short in most of the films examined. Excluding the free-verse film, The River, films in the school list show an average range of from 7.8 words per sentence, to 13.5 words. Again excluding The River, which occurs in both lists, the adult films show an average sentence range of from 8.5 to 16.0 words. The total average number of words per sentence, all films included, is 13.5. Sentence length has been found an important factor in the comprehension of motion pictures according to Park, and is often referred to by film makers themselves as a principle of informational film writing.

The "rate of verbal delivery" of a film narrator appears to be closely and perhaps inseparably allied with what Jasper and Zuckerman have studied as "rate of verbalization," or the number of words desirable per minute of film. Both, in turn, are factors in the understandability of narration or dialogue, and both are, or should be, dependent upon the visual accompaniment and the rate of development of the total audio-visual treatment.

Empirically, we find the average rate of normal speech to be between 120 and 150 words per minute. Nelson, studying the effect of variation of rate on recall by radio listeners, found that a relatively slow rate of 125 words per minute resulted in better recall.
Aspen found a "medium" level of verbalization most desirable in a film dealing with perceptual-motor learning involving the assembly of a breechblock of an anti-aircraft gun. Here, a rate of about 100 words per minute was found more desirable than either faster or slower rates.

In the present study, involving a group of widely-used educational films, five out of nine school-films were found to have an average rate of verbal delivery less than 130 words per minute, with a total average for all films in this group at 123 words per minute. Ten out of thirteen films widely used by adults show an average rate of verbal delivery less than 130 words per minute, with a total average for all films in this group, of 118 words per minute.

Taken as a whole, these results, while not highly reliable for reasons given in the foregoing section, seem to indicate the desirability of a rate of verbal delivery for teaching films of between 100 to 130 words per minute, and the use of a relatively simple vocabulary as measured by a reliable readability formula.

This should, of course, not be interpreted to mean an enforcement of this rate of delivery, or of any particular style of film-writing. If the study of widely-used educational films shows anything reliably, it is that in skillful combination with visual elements, a rich diversity of essentially simple verbal approaches can be successfully undertaken in educational film production.
CHAPTER VI

AUDIENCE INVOLVEMENT

I. Evidence from the Present Study

That persons can become emotionally involved in the content of a film communique is one of the most widely observed phenomena associated with studies of the influence of the motion picture. The effects have been measured in various ways, including changes in the electrical resistance of the skin, changes in pulse rate and temperature, and motility in sleep. Although we have little specific information on the effect of involvement on learning from films, a consideration of this factor seems clearly called for, and more research is obviously necessary on this point.

Audience involvement, though it may vary in intensity with age, sex, and other individual differences, is defined by Blumer as "emotional possession." On the basis of his study of the autobiographies of 634 university students, 481 college students, 583 high school students, 67 office workers, and 58 factory workers, Blumer points out that:

...the psychological characteristics of emotional possession as we may infer them from the accounts given, are essentially a stirring up of feeling, a release of impulse, and a fixation of imagery. The individual is so preoccupied with the picture that its imagery becomes his own.\footnote{Blumer, H. \textit{Movies and Conduct}. New York: Macmillan, 1933, p. 126.}
Although the film experience is "vicarious" in the sense that it is contrived, or second-hand, it is in no sense a passive experience. It appears to involve, to various degrees, a feeling of empathy, or "Einfuehlung" which is described by Irwin Edman as "that tendency of the body to experience in its own tensions and incipient movements what it perceives in external objects."²

The process by which this sense of involvement may be created is not fully understood, although some of the factors which may contribute to the effect have been widely observed and discussed in the creative arts, and have recently been subjected to experimental study. According to the report on Instructional Film Research, published by the Special Devices Center and the Pennsylvania State College:

Research studies indicate that at least six factors enter into the involvement of an audience in a film, but there are more yet to be identified. Although some aspects of these factors are not clearly understood at this time, the available experimental and observational evidence indicates that (1) identification, (2) familiarity, (3) subjective camera, (4) anticipation, (5) participation, and (6) dramatic structure and cartoon form are factors which affect the degree to which the audience is involved in a film presentation.³

Since audience involvement appears to be related to successful communication, the twenty-one widely used films on the Educational Film Library Association list were analyzed in terms of the factors

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³ *Instructional Film Research, 1918-1950*, op. cit., Chap. 8, pp. 5-6.
identified above as those which affect the degree to which an audience becomes involved in the motion picture experience.  

Identification may be defined as the presence of a character in a film with whom members of the intended audience feel a close personal relationship as a result of similarities of race, sex, age, activities, needs, desires, or motives.

In only three of the most used school films on the EFLA list do children appear as protagonists. In Autumn on the Farm, the thread of continuity is built around Joan and Jerry, the farmer's children. In Colonial Children, the portrayal is that of a colonial family with two sisters, Rebecca and Cynthia, and the brother, Jonathan, figuring prominently in the story. These colonial children are much better developed as personalities than the Joan and Jerry of Autumn on the Farm, although primary-level children would probably not be critical of this fact. In Farm Animals, the "farmer's boy" appears, although in a minor role.

Identification, as defined above, does not appear to be a dominant factor in the school films. However, the adult films provide interesting material for discussion on this point, since eight of the thirteen films listed include characters with whom individual members of the presumed adult audience might possibly identify.

In the cartoon film, Brotherhood of Man, Henry and his alter-ego represent the prejudice which resides in most of us, and put forth the

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4 "Subjective camera" is dealt with in Chapter VII and "cartoon form" in Chapter IX.
questions, stupid and embarrassing, which linger in our minds about the equality of the races.

In *Overdependency*, the continuity revolves about James Howard, who is domineered by an overprotective mother, although blessed with an understanding, loyal wife.

In *Preface to a Life* and *Human Reproduction*, young, modern parents play the key role. Daniel and Elizabeth Thompson, who appear in the former picture, are similar in type to John and Mary Burke, the parents in *Human Reproduction*. Both families live in comfortable, upper-middle-class homes, and both sets of parents are concerned about how to bring up their children.

*Feeling of Hostility* features Clare Scott, a young woman who, driven by lack of parental affection, seeks recognition through academic and professional achievement. She is surrounded by a frustrated mother, a henpecked father, and a dependent, unloved half-brother.

In *Angry Boy*, although the protagonist is Tommy Randall, a preadolescent boy, we also find the over-protective mother, the domineering mother-in-law, and the henpecked father.

Ada Adams, a child of about fifteen, is the pathetic little protagonist in *Learning to Understand Children*. However, her teacher, Mary Brown, is logically the one with whom teachers in training would identify. Miss Brown is young, attractive, and represents the highest calibre in the profession. Her problem is also one which many teachers face at some time in their career.

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5 Fig. 3, p. 95.
FIGURE 4
CLASSROOM SCENE FROM BROADER CONCEPT OF METHOD
Mr. Evans, the teacher in *Broader Concept of Method*, plays the part of a boorish disciple of rote teaching in Part I of this film, while in Part II he becomes the affable and understanding classroom leader who recognizes and helps guide student interest in constructive channels. Unlike Miss Brown, Mr. Evans is stylized, tailored to the demands of a film geared too closely, perhaps, to Shorling's *Student Teacher*, the text which the film is designed to supplement.\(^6\)

In terms of audience involvement, therefore, the adult films include more personalities and more problems with which the intended audience might possibly identify than the films designed for school use.

Familiarity, has been identified as a second factor in audience involvement, since it is known that previous experience and knowledge of a subject shown influences the amount of learning from a film. In four of the nine films designated as most used in the schools, characters, places, or situations familiar to many children of school age appear.

In three films, animals are put into familiar family relationships. In *Adventures of Bunny Rabbit*, a story with which many children are familiar, we find "Mrs. Gray Rabbit," "White Rabbit," her cousin, and "Bunny Rabbit." In *Gray Squirrel*, we find "Mother Squirrel," and "Brother Squirrel." Some of the same type of personalization of animals is found in *Common Animals of the Woods*.

In *Land of Liberty* we find personages whom "every schoolboy

\(^6\) Fig. 4, p. 95.
knows"—Washington, Jefferson, Patrick Henry, Ben Franklin, and other well-known figures in American history. We also hear some of the speeches familiar to students through history and literature. We see places which most Americans have at least heard about—Concord Bridge, Bunker Hill, Valley Forge.

In this picture we also see well-known screen personalities playing the parts of historical characters. Claudette Colbert, for example, is seen as an Indian-fighting frontierswoman. The extent to which the appearance of "stars" in this picture affects audience involvement would make an interesting study. It may be speculated that, especially with the older age groups, familiarity with Hollywood screen personalities and their presence on the screen might distract attention from the role being portrayed and from the informational content of the film at that point. Attention-value of such a picture might be high, but retention might be low. At the same time, the possibility cannot be ignored that the prestige value of having a widely-known and liked screen star portray a role of importance might contribute to the learning effectiveness of the film.

In two of the films on the school film list, we find farm settings which would not be familiar to many city children (Farm Animals, Autumn on the Farm). Except for those children who live on the Mississippi, The River would not seem to present many elements with which the average public school student is familiar. The same would appear to be true of The Loon's Necklace, and Colonial Children. All three of the last named films involve events of historical or semi-historical nature.
Among the adult-designed films, six out of thirteen involve homes and human relations problems which are possibly familiar to a great many Americans. These pictures present a composite of what the "average" home is like in terms of setting and furnishings, and include somewhat stereotyped figures of the mother, father, and children, together with emotional problems common to the tense society in which we live (Preface to a Life, Children's Emotions, Angry Boy, Human Reproduction, Feeling of Hostility, Overdependency).

In fourteen of the twenty-one films under consideration, therefore, settings, situations, and personalities possibly familiar to many persons in the audience appear. Obviously, this factor can be truly evaluated only with a specific film and a specific audience.

Anticipation, as another factor in audience involvement, is closely related to "set," or to the establishment of a condition of readiness for the film experience. This condition may be established by the teacher who, previous to the film showing, may point out the importance of the picture, or arouse interest in specific scenes in the film. He may also announce that a test will be given on the material, thus "alerting" the audience to the importance of noting and remembering the content.

A condition of readiness may also be set up by the inclusion of an introduction in the film itself. This point has been mentioned in Chapter IV on "Organizational Factors."

The use of questions in the narration may also be a factor in anticipation, and therefore in audience involvement. In four of the school films on the EFLA list, questions are interlarded which may
serve to recapture attention, and also set up a condition of antici-
patation. For example, in *Autumn on the Farm*, a scene involving a chip-
munk is introduced with the narration: "Now what's this?" Over a
shot of a pheasant, we hear "Will he fly away?" In *Adventures of Sunny
Rabbit*, the following questions are phrased: "Will she (Mother Rabbit)
get home safely?" "Will he (the Farmer) find Bunny?" "What do you
think he (Bunny Rabbit) is telling Mother Gray Rabbit— and what do you
think Mother Rabbit is telling Bunny?" In *Gray Squirrel* questions also
precede the introduction of new actions or information. For example:
"Where is Mrs. Squirrel going?" "What is this pile of leaves in the
tree?" "What is Brother Squirrel going to do?" etc. In *Common
Animals of the Woods*, statements rather than questions, alert the
audience to a forthcoming development: "Let us watch her (a mink)
closely." "See where he (a beaver) has gnawed down trees with his
sharp teeth." "Let's watch how he does it" (a porcupine climbing a
tree).

In six of the adult films, questions or statements are set up
which may contribute to a sense of anticipation. For example, in
*Human Reproduction*, as a child asks the inevitable question about
where babies come from, the narrative poses the question: "What are
you going to do or say when something like this takes place in your
own household?" In *Brotherhood of Man* rhetorical questions form the
core of the film, beginning with: "What about this business of
brotherhood?" and going through questions, stated or implied, about
the physical and cultural differences between the races of man.
*Boundary Lines* also opens with a question: "What is a line, anyway?"
Children’s Emotions alerts the audience by stating questions pertaining to the emotional growth of a child: “What kind of child will he be?” “What is there to frighten babies?” A sequence showing how thoughtless adult behavior can frighten children, is introduced with: “How would you like it if this happened to you?” Similarly, in America the Beautiful, a number of questions relating to scenes which follow, may serve to create a condition of anticipation, as, for example: “Now, how about rivers? You like rivers?” “Well, how about Yellowstone?” and “Say, ever been to Coney Island?” The film, Animals Unlimited, attempts to build a sense of anticipation in its introduction to Africa by emphasizing that “you are going into a different world.”

Anticipation is also related to dramatic form, since issues or outcomes which are in doubt are involved, and a degree of conflict and suspense is implied.

Dramatic structure may be defined as the portrayal of a physical or emotional conflict in which the outcome is in doubt, and which is so presented that it will arouse a feeling of "empathy," on the part of the audience. Many of the other elements here considered in connection with audience involvement, obviously enter into the making of a dramatic portrayal. For example, the audience must be able to identify itself with one or the other party to the conflict, and must be familiar enough with the situation to understand the issue in terms of their own experience.

If we examine the dramatic structure of twenty-one widely used teaching films, in terms of the presence of conflicts, or issues which are in doubt, we find that although all have a "story," or narrative
with a beginning, a middle, and an end, only three of the school films (The Loon's Necklace, Land of Liberty and The River) involve a conflict drawn sharply enough to be defined as "dramatic."

On the other hand, ten of the thirteen films listed as most used by adults are essentially problem situations involving conflicts between man and nature (The River), conflicts between man and his fellowmen (Boundary Lines, Brotherhood of Man), and conflicts between man and his own understanding of himself and others (Children's Emotions, Angry Boy, Human Reproduction, Feeling of Hostility, Overdependency, Understanding Children, Broader Concept of Method).

In the films on the adult list, therefore, dramatic structure is more widely found than among the school films. In general, the adult films involve attempts to change attitudes, and the emotionally-charged, dramatic story approach is apparently employed for this purpose.

A final factor in audience involvement has been identified as participation. Obviously, covert participation may occur as a reaction to any of the elements discussed above, and many outcomes of film experiences have been found to be of this type, as will be pointed out later in connection with research on audience involvement.

Participation in a motion picture experience, however, may also be overt, and certain types of instructional films have been deliberately planned for such effect. For example, at Purdue University, films on mechanical drawing have been designed so that they may be stopped at predetermined intervals during which time the learners actually draw the letters as shown in the film performance. Also, an
instructional film may be "open ended," with specific instructions as to how the class may proceed on the basis of what has been learned.

None of the twenty-one films analyzed in the present study appear to be specifically designed for audience participation of the overt type. Although suggested activities are found in the teacher's guides which accompany some of the films in the school list, in none of the films on either the school or adult level are provisions made in the film itself for such overt activities.7

However, a number of these films are in a sense, "open ended," in that they end on a question, or conclude with a situation which is not completely resolved. For example, Adventures of Bunny Rabbit ends with: "And now Bunny is once more with his mother. What do you think he is telling Mother Gray Rabbit—and what do you think Mother Rabbit is telling Bunny?" Angry Boy, Overdependency, Feeling of Hostility, and Learning to Understand Children end on a situation which leaves the outcome of the story in some doubt. In each case, the human relations problem involved has not been completely solved at the close of the film, although improvement is shown. In Broader Concept of Method the problem is rephrased, and answered problematically:

What is the function of method? Is it to teach factual material, or provide experiences in solving problems and working together? The answer depends upon the educational objective, for method is the means to the end.

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7See Appendix C, pp. 275-278.
In summary, then, upon breaking down the element of audience involvement into the factors of identification, familiarity, anticipation, dramatic structure, and participation, it is seen that each of the twenty-one most used educational films in the present study include one or more of these factors in its structure. It is also seen that these factors interact and obviously overlap. Finally, it is recognized that other factors may also contribute to audience involvement, such as the teacher's utilization of the film, and other related activities outside the film experience itself.

At least two other factors within the film may also promote audience involvement: subjective camera, which is dealt with in Chapter VII on "Camera Interpretation," and cartoon form, which is considered in Chapter IX, on "Animation."

2. Empirical Evidence

Perhaps the most important theory on which the practical motion picture maker relies is that audiences identify themselves not only with screen personalities who are like themselves, but more importantly with people they wish to be like. The Hollywood view of this matter is well expressed by Eugene Val:

Identification is caused by the desire to partake in other people's lives. This desire is particularly strong in people whose own lives are dull and empty, while people whose lives are full and rich will be much less desirous to identify themselves with others, which means that they look after their own business and are less curious than others...

Principally it can be said that the spectator will only identify himself with persons who correspond to his tastes, to his wishes and desires. This being the case, there need be no identity of character between the actor of the
story and the spectator. An old woman in the audience can easily identify herself with a young and beautiful actress because youth and beauty may correspond to the old and ugly woman's wishes and desires. A young girl in the audience can identify herself with an old woman on the screen as long as the old woman has some admirable qualities. A justice of the peace in the audience can identify himself partially with a gangster on the screen as long as this gangster shows some nice qualities like outstanding courage or pity, or if he is kind to the poor. Primarily, of course, you will find identification with the hero and with the heroine, from the male and female element of the audience, respectively, regardless of age or beauty. But the identification is not limited to the hero or the heroine, nor is it limited to only one person of the story. The spectator may identify himself for short moments with one or two persons of the story, just as soon as this person is in some relation with the spectator or with the spectator's wishes or desires.  

Comparing the results of identification to the taking of sides in a sporting event, Yale also suggests that when we have good identification, our retention of the details of the experience is effected. "For one thing," he says, "you may notice at the end of the game that you remember only the actions of your team, while those of the other side are hardly recalled and if they are, not as actions but as hindrances and difficulties to the actions of your side."  

That this same identification can obtain in the realistic or documentary film presentation without glamorous stars is illustrated by Flaherty in his description of an Eskimo audience to whom he showed "rushes" of Nanook of the North, the classic documentary. This unsophisticated audience was seeing a motion picture for the first time.

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9 Ibid., p. 211.
At first they kept looking back at the source of the light in the projector as much as they did at the screen. I was sure the show would flop, when suddenly someone shouted, "Iviuk! (walrus!)" There they were—a school of them—lying basking on the beach. In the foreground could be seen Nanook and his crew, harpoon in hand, stalking on their bellies toward them. Suddenly the walrus take alarm; they begin to tumble into the water. Suddenly there was one agonizing shriek from the audience, until Hanook leaping to his feet thrust his harpoon. In the tug-of-war that ensued between the walrus now in the water and Nanook and his men holding desperately to the harpoon line, pandemonium broke loose; every last man, woman and child in the room was fighting that walrus, no surer than Hanook was at the time that the walrus would not get away. "Hold him!" they would yell, "Hold him!—Hold him!"

That the factor of identification is important to children as well as adults, is reported by Hoban:

Generally speaking, students are interested in the personalities that play a part in a motion picture, and they are most interested in personalities of their own age shown doing the things that children of that age generally do. This interest is an expanding interest. It spreads to other personalities in a picture when these are typical of personalities ordinarily related to the experience of children. Fifth-grade children, for instance, are vitally interested in the activities of children of similar age shown in a film, and their interest expands to the brothers and sisters, fathers and mothers as these children in the film. The students are not nearly as interested in adults if the latter do not assume the father or mother role in the film, or if, as fathers and mothers, their children are much older than the children in the school group viewing the film. Younger children are also interested in older children shown in the film, but older children are seldom as interested in younger children, except as other factors would foster this interest.


\(^{11}\) Hoban, Focus on Learning, op. cit., p. 46.
Referring to the film, *Colonial Children*, Hoban notes that:

...The predominant response of the children in the class related to the children in the picture and involved interpretation in terms of present-day activities and manners. It appears significant that the children in the film were essentially the same age as those in the class...

The effective use of characterization of the same general age group as the audience, and...of the same sex, shown doing the desirable kinds of things that other people of that same age and sex do, is one of those potentials of a motion picture that makes for experience fundamentally different from that of the dehydrated textbook and the textbook recitation.*12

Empirical evidence would thus seem to suggest that identification is an important factor in the entertainment, the documentary, and the educational film. Identification appears to be based on a human desire to "partake in other people's lives," as Vale puts it, and "principally it can be said that the spectator will only identify himself with persons who correspond to his tastes, to his wishes, and desires."

The element of familiarity in establishing audience involvement is identified observationally by Hoban:

Generally speaking, students respond most readily and most favorably to familiar things in unfamiliar situations and to new things in familiar situations. This is just another way of saying that we proceed from the known to the unknown, that we grasp new truths through old ones.*13

While making films for village audiences in Turkey, the writer found one case where an American-made film showing improved methods

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12 Ibid., pp. 47-49.
13 Ibid., pp. 59-60.
of egg production was viewed with interest by Turkish farmers, although no real conviction about the desirability of these methods was established because the audience believed that the modern hen-houses shown were dwelling places and not really chicken houses at all. The whole message of the film was discounted because the Turks were completely unfamiliar with the appearance of an American chicken farm, and with methods which were too far beyond the dreams and wishes of the average villager, who would rather see "how a Turk does it." No old truths were included to temper and make the new ideas believable.

The value of the "anticipation," or suspense, and conflict involved in the dramatic story film has long been appreciated by teachers of literature and drama. The excerpts of Hollywood films edited by Alice Keliher for the Human Relations Committee of the Progressive Education Association found wide acceptance wherever they were shown.

The documentary film movement gave impetus to the idea that life itself is basically dramatic, but that events need to be extracted, analyzed, and condensed, and that the conflicts of modern life must be made sharp and clear if they are to be understood. Typifying the early documentary philosophy in England, Grierson writes:

There are...basic dramatic patterns in the terms of civic relationship since all social problems are bound to involve a relationship between people and forces. Revelation of these dramatic patterns is a first essential in the process of modern education. For young people and adults alike require a broad and lively picture of their society to stir their imaginations and instill the loyalties necessary if they are to face up to its problems. In short, we felt that the dramatic
pattern could convey a sense of growth and movement and opposition, provide a grip on reality and secure a sense of action regarding it.\textsuperscript{14}

The documentary gave a new direction to drama in the motion picture. Common people in ordinary jobs were the protagonists. The functioning of a post-office department, the power of a river, a day in the life of a fisherman, in the hands of skillful documentary directors and cameramen, became "the poetry of the commonplace."\textsuperscript{15}

Further impetus for dramatic structure in educational films came during World War II. A Navy training film officer, for example, states that the training film must frame the problem, suggest the solution, and provide the motivation for action, concluding that the story form is best for this purpose. He feels that such films should follow the structure of the novel, the short story, or the drama, because these forms are most interesting from an organizational point of view, because they can throw light on specific overt behavior, and because they are most likely to encourage identification.\textsuperscript{16}

In developing films for these important educational purposes the Army applied to educational films the dramatic techniques hitherto used only in entertainment films. These techniques resulted in films which were emotionally possessive as well as intellectually stimulating, and, as a consequence, Army films penetrated deeper into the recesses of the human mind than do school films which coldly present a series of related

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\item[\textsuperscript{15}] Benoit-Levy, op. cit., p. 131.
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facts without relating these facts to the background, interests, motives, and actions of the people to whom they are shown. 17

As an example of this type of film, the Army Air Force produced *Resisting Enemy Interrogation*, which was nominated for an Academy Award, and was "as exciting as any Alfred Hitchcock thriller," 18 and the Army developed a whole series of films on survival among which was the well-known, *Kill or Be Killed*.

The trend towards the use of dramatic structure as a means to audience involvement was accompanied by warnings against the inconsiderate use of this expensive and exacting form for educational films. Greenberg and Wald, for example, cautioned:

Unquestionably, utilizing storytelling technique in educational films is not always most advantageous. Less information can be presented than with the use of straight narration. Production costs, too, are generally greater. And it is possible for the story to interfere with points to be taught. Although the pros and cons of telling a story must be weighed for each educational film, it should be emphasized that dramatic effects—heightening interest, characterization, etc.—can be applied in many ways. 19

Roberts, harking back to the philosophy of the documentary film makers, states: "The use of the story form is not free from danger. The training film maker who says, "'Let us make a story out of it' should say 'Let us find the story in it.'" 20 And Hoban, summarizing the Armed Forces film production program, points out audience involvement is required for the particular film job to be done:

18 Greenberg, and Wald, op. cit., p. 415.
19 Loc. cit.
20 Roberts, op. cit., p. 347.
In general, story treatment, characterization, and use of various interest-catching techniques are appropriate in films intended for introductory or refresher use in teaching a subject to a general audience,...the purely expository type of film, with straight factual presentation and purely impersonal commentary and explanation, is appropriate to any subject in which it can reasonably be assumed that interest, curiosity, and the motive for achievement are already present in the audience, that its curiosity for more knowledge has been awakened, and its energy has become directed toward mastery of the subject.21

At the moment, however, we are not concerned with when to use or not to use dramatic structure in an educational film. We are interested only in the fact that the use of such structure is felt, by film makers and by educators, to contribute to a condition, described in this chapter as "audience involvement."

"Anticipation," or suspense, is a part of dramatic structure, although in the previous section this element has been discussed separately. The function of this important ingredient in the well constructed play or theatrical film is described by Beranger as follows:

Anticipation in an audience differs from mere curiosity in that it implies the ability to foresee what will happen. When audiences at a play or picture believe they know what is going to happen, and are eager to find out whether they are right or wrong, they watch with increasing interest as the drama unfolds. Anticipation includes intuition, foresight, and an expectation of events in the future, and creates greater receptivity to the story. Foresight without definite foreknowledge adds zest to the enjoyment of a play.22

21 Hoban. Movies that Teach. op. cit., pp. 96-97.
22 Beranger, op. cit., p. 115.
A film which can create a sense of anticipation, according to Beranger, can make viewers "eager to find out if they are right or wrong," about the outcome of the picture, and that as a result, "they watch with increasing interest."

If the covert participation thus aroused could be extended beyond the film experience itself, audience involvement might result in further overt participation. While the exact form of this participation or activity would continue to be the responsibility of the teacher who uses the film, it would seem that techniques of audience involvement, built into the educational film might appreciably extend the effect of the motion picture communiqué.

One of the significant advances in teaching technique in war-training films may be described as "leaving the film open at the end." Instead of a final sequence which closes the film with throttling finality, the truly educational film will turn the subject to the audience, leaving the audience not fully satisfied, but with questions it must answer for itself, with a challenge to "go and do in like manner."

Taken as a whole, then, the empirical evidence strongly suggests the value and necessity for audience involvement especially in films designed to shift attitudes, to maintain interest, to make ideas believable, sharpen and clarify conflicting points of view, and provide motivation for action.

23Hoban, Movies that Teach, op. cit., p. 103.
3. Experimental Evidence

Much of the total mass of existing experimental evidence on the effect of motion pictures is based on studies involving the responses of audiences to dramatic films in which the elements of identification, familiarity, participation, and other factors in audience involvement are central in the treatment of the theme.

This evidence shows that the motion picture experience is an active, rather than a passive one. Films, for example, may create empathetic responses, or audience involvement leading to imitation, increase related activities such as reading, improve retention shift attitudes, increase motility in sleep, and promote participation in the classroom.

The effect of any film appears, experimentally, to be proportional to the degree it approximates the background of needs and interests of the intended audience. Physiological responses to dramatic films, for example, vary with the age and sex of the viewer, those under twelve responding to "pseudo-tragedy, conflict, and danger" more readily than those over age twelve.

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24 Blumer, loc. cit.
26 Holaday and Stoddard, loc. cit.
While physiological and emotional reactions have been noted in films which include elements contributing to audience involvement, there appears to be little reliable experimental evidence on the influence of such elements on informational learning.

Studying the effect of identification, Kishler, of the Instructional Film Research Program staff, attempted to measure the effect of the film, Keys of the Kingdom, on the attitudes of college students. Gregory Peck played a Catholic priest in this film, and Kishler's intent was to study the effect of the role in influencing attitudes of students who had previously rated this institutional role, and had been accordingly divided into "high prestige" and "low prestige" groups on the basis of their reactions.

After showing the film, Kishler found in testing the two groups, that both had moved in the direction intended by the film--towards greater religious tolerance--but that the change was slightly and unreliably greater in the case of those students who originally held the role of Catholic priest in high prestige. There was also a suggestion, reliable at the six per cent level of confidence, that this group learned more from the film.31

The use of two children as protagonists in a test film was studied by the Motion Picture Research Project at Yale, in a film designed for the elementary level. One version showed a father explaining seasonal changes to his small son and daughter. The

same material was presented in an expository manner in a parallel version. The result was a small, unreliable difference in favor of the version involving the small boy and girl. 32

The results of a Gallup survey tend to support the hypothesis that movie audiences identify themselves with screen personalities:

The upshot of the research is that individuals choose as their favorite movie stars those with whom they can most easily identify themselves—persons of the same sex, of comparable age, and who tend to be cast in roles that represent a person of their income group. 33

Familiarity is indicated as a factor in audience involvement and also in experimental evidence related to learning from films, although research on the latter point is weak.

Studies by Holaday and Stoddard, 34 and by Sturzthal and Curtis 35 show that an audience becomes involved with and understands familiar settings and types of activities when these are presented in an emotional context, better than if unfamiliar activities are shown in a non-emotional context. The operation of emotional factors weakens the case for familiarity alone as a means of gaining understanding, and the research suggests a complex of elements which makes it difficult to isolate any single factor as the key element in involvement and in the promotion of learning from a film.

32 Yale Motion Picture Research Project Experiment. Unpublished study reported in Instructional Film Research, op. cit., Chap. 8, p. 7.
34 Holaday, and Stoddard, loc. cit.
35 Sturzthal, and Curtis, loc. cit.
A study conducted by the Schwerin Research Corporation, for example, shows the inter-related effect of identification and familiarity with respect to a television commercial. In "Commercial A," an attractively dressed woman, looking directly at the audience, gave her name, explained that she was a housewife, and that she used product "X" for a variety of reasons. In an alternate version of the same commercial the same woman, wearing an apron, was shown standing at a stove. Stopping in her "work," she turned to the audience and made exactly the same points about product "X" as she had in "Commercial A," and in the same order. The first commercial received 63 responses per 100 viewers, the second 108 responses per 100 viewers. This was interpreted to mean that identification was achieved visually and more realistically in the second presentation, where the speaker was placed in a familiar kitchen setting and where the message carried a more "personalized meaning" for the average housewife. 36

Some of the research on "anticipation" has already been mentioned in Chapter IV in terms of introductions to films. The effect of anticipation as related to audience involvement was also noticed by Sturmthal and Curtis, 37 and by Dysinger and Ruckmick. 38 Evaluating

37 Sturmthal, and Curtis, loc. cit.
38 Dysinger, and Ruckmick, loc. cit.
the latter study, reviewers in the Instructional Film Research Program at the Pennsylvania State College have this to say:

...Anticipation of possible developments in the story seemed to be a factor in the emotional and perceptual experience of children and adults. Depending upon conditions, anticipation appeared to serve as either a deterrent or a stimulant to emotional response. Anticipation of fearful consequences, without "adult discount," increased emotional intensity, but when all developments were expected, because of either "adult discount," or previous experience with similar pictures, emotional response decreased or was entirely lacking.

This may be interpreted to mean that instructional films for some purposes, especially attitudinal development, may be more effective when an instructional stereotype is avoided, when the ending is not easily predictable and the final answer is not provided in the film. 39

Identification, familiarity, and anticipation or suspense, are related to dramatic form in ways which make it difficult to isolate and discuss "dramatic structure" per se. As a result, there is very little experimental evidence of real significance on the relationship of dramatic structure to audience involvement and to learning from films. Also, the "expository" and the "dramatic" are part of the same continuum. How, for example, would one classify The River, except to say that it is an expository film with the impact of drama?

The degree to which a film idea must be made dramatic obviously depends upon its purpose and intended audience. There are, however, no adequate studies comparing "expository" film form with "dramatic" form using the same subject matter, although a few related studies which compare dramatic and expository presentations in radio and

39 Instructional Film Research, 1918-1950, op. cit., Chap. 8, p. 10.
recordings tend to be slightly favorable to the dramatized versions. Hovland, Lumsdaine, and Sheffield, for example, using two recordings—one dramatizing post-war problems in Japan, the other presenting the same material through straight narration—found Army trainees slightly more interested in the dramatic version, and somewhat more inclined to accept the dramatization as being more reliable and authentic than the straight commentary. The results were not statistically significant.

An earlier study by Willis, also inconclusive, indicated a radio dramatization to be slightly more effective in shifting attitudes of high-school and college students than either a combined talk and dramatization, or a straight talk alone.

Hartman's experiment with emotional and rational political leaflets in determining election results, also seems to indicate the potential of dramatic presentation in shifting attitudes.

While dramatic structure is generally found to be a factor in audience involvement, therefore, the fact remains that there are virtually no studies which investigate the expository vs. the dramatic form in terms of informational learning from motion pictures.

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40 Hovland, Lumsdaine, and Sheffield, loc. cit.
mentally, we are left with the conclusion of the reviewers in the Instructional Film Research Program:

There is evidence of emotional involvement resulting during showing of well-produced dramatic films; whether similar involvement can be obtained from the expository type of film, remains to be demonstrated, but it is doubtful. Dramatic structure is no guarantee of involvement. Many factors seem to interact in producing involvement.

Whether the involvement aroused through dramatic structure will facilitate learning appears to depend upon the desired learning outcomes and upon the nature of the involvement produced. Dramatic structure may be more effective for certain learning outcomes than expository presentation, although this remains to be demonstrated. For instance, dramatic structure may be more effective for changing attitudes. All the studies on attitudinal changes from films have used either dramatic or documentary form, so the question is not answered. Expository treatment may be equally or more effective for informational learning.43

Research has thus been undertaken on identification, familiarity, anticipation, and dramatic structure. A final element of audience involvement which has been dealt with experimentally, is participation.

As early as 1936, Hall found that learning was facilitated, for junior high-school students of science, by questions projected on the screen before and after the showing of silent films.44

Hovland, Lumsdaine, and Sheffield, using sound film strips, developed alternate versions designed to teach the phonetic alphabet. In one version, the audience was required to call out the letters, and their phonetic equivalents. With test groups, the partici-

43Instructional Film Research, 1918-1960, op. cit., Chap. 8, p. 32.
participation version was found to be 20 per cent superior to the non-participation version, reliable at the one per cent level of confidence. Analysis of the findings revealed that the participation version was superior especially where difficult material was involved. It was also found, however, that the announcement that the group would be tested on the material in the filmstrip, produced about the same amount of learning as that resulting from the participation version, the latter being only 5.2 per cent superior to the standard version plus the announcement of a forthcoming test. The researchers also found that "the less intelligent groups profited most from the increased audience participation."45

The Yale Motion Picture Research Project also included experiments involving overt participation by the audience. "Participation questions" in title form were inserted in an experimental version of an exciting film on the heart and circulatory system. The 150 high school students involved in the experiment were then required to answer the question on a worksheet during the film showing. The correct answer was given later, also in the form of a screen title. The informational gain of the participation version in terms of correct responses was 12.2 per cent as contrasted with 8.2 per cent resulting from the factual version shown once. When the factual, or non-participation version was shown twice, however, the informational gain was found to be 12.0 per cent, or approximately the same as the participa-

45 Hovland, Lumsdaine, and Sheffield, op. cit., p. 240.
Gibson, studied the effects of "immediate reinforcement" in learning from a series of slides on enemy aircraft identification. He found that trainees who were shown a series of twenty pictures of foreign planes three times, were required to write the name of each plane on the second and third showings, and then were asked to check their answers against the correct answer, were more than forty per cent superior to trainees who had not been required to participate in the second and third showing of the slides. This finding was highly reliable, with a critical ratio of 7.69.

The evidence on the effectiveness of questions inserted in instructional films to encourage participation is inconclusive, as indicated in studies by Brenner, Walter, and Kurtz, and in an unpublished study by the Yale Motion Picture Research Project.

Two studies, undertaken by the Instructional Film Research Program at Pennsylvania State College, involving participation in films on knot-tying and breech-block assembly relate the effectiveness of participation to rate of development. Roshal found no significant difference in participation and non-participation versions of

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46 Yale Motion Picture Research Project. "Do 'Motivation' and 'Participation' Questions Increase Learning?", Loc. cit.
47 Gibson, Loc. cit.
49 Yale Motion Picture Research Project Experiment (Unpublished), Loc. cit.
films illustrating how to tie a series of knots, and suggested that the films moved too fast for effective participation.  

Jaspen, using two versions of a film showing how to assemble the breechblock of a 40mm anti-aircraft gun, tested Roshal's hypothesis, and found that:

...Audience participation is a very effective utilization procedure in teaching this task, when the rate of development of the film is slow enough to permit the learners to view the film and assemble the breechblock without too much loss of attention to either. Conversely, the requirement of audience participation seems to have a negative effect if the film develops rapidly.

Finally, in recent experiments in teaching Army trainees by television in the Enlisted Department of The Signal School, Fort Monmouth, New Jersey, programs involving student participation were reported as most popular with students, and most effective by instructors. In one experiment, for example, each student, equipped with a Cine-Kodak motion picture camera, mounted and dismounted certain parts, such as the lenses and the magazine, by following the examples set by the television instructor during the telecast. Wire splicing, and circuit tracing were techniques also successfully taught by this participation method.

The technique of participation is an established and educational procedure, a simple example of the effectiveness of "learning by doing."

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50 Roshal, loc. cit.
Summary

Motion picture experiences, although vicarious and "second-hand," are in no sense passive experiences. The evidence points to the fact that people do become emotionally involved in certain types of motion pictures, and that physiological and psychological changes often occur as a result. Audience involvement is essentially "emotional possession," and appears to be proportional to the degree to which a film meets the needs, interests, and desires of individual viewers.

Several factors contribute to audience involvement, including identification with screen personalities or with ideas or principles which they symbolize; anticipation resulting from situations the outcome of which is in doubt; dramatic structure involving physical or psychological conflict; and overt or covert participation instigated by the film or by the conditions of its use.

People of all ages, including children and illiterate or unsophisticated adults tend to identify themselves with screen personalities of their own age, sex, and socio-economic status. New ideas or situations are likely to be most acceptable to an audience when these new ideas are based on familiar settings and situations. Dramatic structure, including "anticipation," or suspense, and elements of conflict, capture attention and create interest, while the story form serves to organize ideas in a logical order, making for a simple, easily understood communique. Films which encourage participation on the part of the audience, and which are paced slowly enough to permit such participation, also seem to promote audience involvement and increase the effectiveness of the presentation.
Experimental evidence on the effect of audience involvement on specific learning from films is neither complete nor decisive. However, a considerable proportion of the existing research suggests that audience involvement may be not only productive of emotional changes in the viewers, but also that increases in factual learning may possibly be effected. More research is badly needed in this area. At this time, for example, we have yet no reliable information on the relative effect of an "expository" vs. a "dramatic" film presentation of the same material.

All of the twenty-one films included in the present study of most used films, contain one or more elements which have been found to contribute to audience involvement. These features occur more often in the group of adult films than in the list of films used in the schools. The adult films are generally designed to shift attitudes, and deal with the human emotions. The school films, with the exception of The River, The Loon's Necklace, and possibly Land of Liberty, are expository in style. The "expository" and the "dramatic," however, are on a grey-scale and we are not likely to find a clear dividing line between the two styles because, as pointed out in Chapter I, there can be no real separation of the intellect and the emotions.

The producer of the educational film must select for each film and for each audience, on a continuum representing the range from the factual to the dramatic, a point representing the degree to which audience involvement seems necessary. His decision will have to be based on consideration of the background of the viewers, the nature of the subject matter, and the purpose of the film.
On the one hand, he must remember that dramatic films are usually somewhat more expensive to make than non-dramatic presentations, that inexpert handling of dramatization may have a negative effect on audience involvement, and that with highly motivated audiences familiar with the subject matter, a high degree of dramatization may be wholly unnecessary.

Where motivation is required, on the other hand, elements contributing to audience involvement may be built into the educational film. It is conceivable, too, that the well-designed story film with its elements of identification, familiarity, anticipation, and dramatic structure, may some day be more fully developed as an instrument useful not only for arousing interest in subject matter, but also for the deliberate promotion of reflective thinking.

"The dramatic pattern," says Grierson, can "convey a sense of growth and movement and opposition, provide a grip on reality and secure a sense of action regarding it."53 And Dewey points out that "thinking begins in what may fairly enough be called a forked-road situation, a situation that is ambiguous, that presents a dilemma, that proposes alternatives."54

One of the important developments of the educational film in the future may be the dramatization of familiar problems taken from the complex pattern of modern life, and presented in terms of alternatives. These would be "open-ended" films, designed to promote further think-

53. Hardy, loc. cit.
ing and provide the basis for overt action. The dramatization of vital issues of modern life as these become more numerous and complex, may become a virtual necessity if we are to recognize, understand, and deal with them at all. To this end we shall need competent, conscientious film makers, and perceptive educators who, in the process of producing such films, might come to agree with Shaw that "the honest artist does not pretend that his fictions are facts; but he may claim as I do that it is only through fiction that facts can be made instructive or even intelligible." 55

CHAPTER VII
CAMERA INTERPRETATION

1. Evidence from the Present Study

Excellent photographic quality characterizes the most used films on the EFLA list, ranging from the work of Dick Wolff, the African wildlife photographer who shot *Animals Unlimited*, to the highly specialized animation of Nathan Sobel, who did the photography on *Boundary Lines*. Other well-known motion picture photographers represented in the group of films selected for study include Willard Van Dyke, Floyd Crosby, Peter Glushanok, Boris Kauffman, and Jean-Marie Couture.

Camera interpretation, as considered here however, involves not only clear, sharp, well exposed and professionally lighted scenes, but also point of view. Thus, whenever a camera is positioned for photography, two factors are inevitably involved: (1) the distance of the camera from subject, and (2) the angle from which the scene will be photographed.

The distance at which the camera is placed from a subject involves orientation of the audience to that which they are about to see. This is done through the use of the three standard camera positions known traditionally as the "long shot," "medium shot," and "close up." These are loose categories, to be sure, but may be considered in reference to the human form in which the full figure represents the long shot, a waist-view the medium shot, and a full frame of the face the close up.
The angle at which the camera is placed involves both orientation and interpretation. A low camera angle encourages a different interpretation than a high angle view of the same subject. Thus, an actor shot from a low camera angle presents an imposing, impressive appearance to an audience, while another shot from a high angle, appears to be subordinate, depressed, or inferior. The camera, of course, may also be moved towards or away from the subject (i.e. "dollied"), tilted vertically through an angle of 90°, or moved horizontally through 360° (i.e. "panned").

Considering camera interpretation primarily in terms of the distance and angle of the camera in relation to the subject, the writer, in viewing each film, used a simple code to record long shots, medium shots, and close ups, numbering them "1," "2," and "3," respectively. Descriptive notes were taken separately on camera angles and on camera movements.

This analysis of camera interpretation shows that certain films under consideration are composed of a preponderance of close ups. This is true in the school films, Adventures of Bunny Rabbit, and Common Animals of the Woods. Close-ups and low angle shots of animals which clearly describe the appearance of the rabbit or skunk are, however, tempered by scenes showing the relation of the animal to other objects the sizes of which are familiar to children. Wherever this is not done, there is the possibility of loss of orientation.

\[^1\text{See Appendix F, pp. 281-85 for method used in defining "long shots," "medium shots," and "close-ups."}\]
Preface to a Life, Children's Emotions, Angry Boy, and Feeling of Hostility also prove to be composed primarily of close-ups. The facility of the camera to concentrate on the flicker of an eyelash, the tremble of a hand, the wrinkling of a forehead, makes it an ideal vehicle for the communication of inner thoughts and feelings. Coupled with appropriate camera angle, lighting, commentary, and music, the close-up is much used in the production of films with a psychiatric or psychological theme.

In most of the films on the list, the long shot was used primarily for orientation, the medium shot for amplification, and the close-up for interpretation. As might be expected, most films in both school and adult lists were composed of more medium shots than either long or close shots. The films, Brotherhood of Man, and Boundary Lines, being of unconventional form, were omitted from the analysis on this point.

Films in the school list show little use of camera angle to build interpretation. These are mostly early films, and are composed of straight-forward photography and conventional long shot, medium shot, close-up design. Three films in this group, however, merit consideration on this point.

The Loon's Necklace is characterized by extensive camera movement including dolly shots, zooms, and pans. Land of Liberty is an example of typical Hollywood camera work, in which use is made of crane shots, long trucking shots, and dramatic composition. The River is a study of camera angles and composition of artistic effect and visual impact. The use of effective close-ups in this picture serves to intensify the
impression. One reviewer, referring to a close-up of an icicle melting drops of water onto bare ground, said that this key scene answers the question what causes floods.²

The deliberate use of camera angle to build effect is most noticeable in several of the films on the adult list, whose subject matter naturally suggests such camera treatment.

In Children's Emotions the camera is used to show adult life and grown-up behavior as seen through the eyes of a child as, for example, in the following sequence:

85. 6 months old baby cries angrily in crib on stomach. Anger is another emotion which begins very early in life. There are so many things that don't go the way you want them to.

86. Room as seen from crib-- You know it's infuriating to be stuck here on your stomach and not be able to turn over.

behind bars.

87. Mother comes into room, If you get angry enough, and bends over camera talking pleasantly. cry loud enough somebody usually comes to do something for you.

88. Mix to Mother changing But why does she always have pants with safety pins to change your pants instead of picking you up?
in mouth.

That the virtuosity of the camera may also be exploited for its own sake is suggested in Overdependency. In one scene, the camera is subjectively positioned to show the operating room as seen through the eyes of a small boy about to have his tonsils removed. The point is well made and effectively done directorially and photographically.

But the fact that the camera can be subjective becomes obvious as the scene is continued on the screen long after the point has been made. A dream sequence in the same picture, again excellently conceived and photographed, seems equally labored and unnecessarily long. In the same vein is the use of special angles in the drug-store sequence where the camera plays on a malted milk shaker to develop a short time-lapse effect which tends to disorient rather than communicate.

These are examples of how, in the film designed to communicate, camera angle, direction, or editing must have, as its first consideration, the necessity for complete orientation, visual simplicity, and intelligibility of the pictorial symbolism in each scene, and sequence.

A survey of camera interpretation in these widely used films, therefore, shows in all cases the production of technically good photographic images, and in the majority of cases the selection of camera viewpoints which are used primarily to orient, and explain, and in some cases to emotionalize. The importance of selection cannot be overemphasized. The elimination of non-essential information in the development of the visual cue appears to be the basis of the motion picture just as it is in other graphic arts. Through an intelligent selection process, it is possible for the film maker to orient the observer step by step, recreate an experience in terms of the viewer with the use of the subjective camera, and thus create a pictorial symbol which may convey both informational and emotional meaning.
2. Empirical Evidence

Motion picture camera techniques have developed to the point where today they are taken quite for granted. The photographic standards of the educational film are rapidly approaching those of the theatrical film. Technical excellence is expected in both.

It is often forgotten, therefore, that these technical and artistic standards did not emerge full-blown with the development of the Kinetoscope, but that the technique of communicating by motion picture had to be developed. We have had to learn "how to say it" with the motion picture camera.

In the early days of cinema, for example, it was considered bad camera practice to show less than the whole actor, legs and all. The possibilities of different camera positions were soon sensed; however, and Edwin S. Porter, in The Great Train Robbery used a medium shot of a cowboy firing a gun directly at the audience to introduce this history-making film. Members of that early film audience are said to have experienced much the same sense of participation as modern audiences seeing one of the new large-screen or three-dimensional films of today.

Griffith was the first to exploit the use of the close-up and the extreme close-up, and to standardize a basic shot plan which involved the long shot, medium shot, and close-up.

While by no means a standard pattern for all purposes, for clarity and understandability essential to the film designed to teach, most educational film producers would agree on an approach picturing the center of interest in its surroundings (long shot), moving to a
closer examination of the distinguishing characteristics or action (medium shot), and then detailing the subject and its action (close-up). This fact, as pointed out in the previous section, has been noted with reference to the group of educational films under study.

Spottiswoode, writing primarily on the theatrical film, sensibly cautions that we should not make a hide-bound rule of this approach:

The old adage that each scene should be covered in long shot, medium shot, and close-up has only one useful application: it serves as a reminder that a long scene must be covered from more than one point of view. In all other respects it is likely to prove dangerous by substituting a mechanical rule for the director's initiative and imagination.

In the educational film, however, as Spottiswoode would probably agree, the director's imagination alone cannot be substituted for a recognition of his first responsibility which is to make himself understood. The director of the educational film is a communicator of ideas first of all, and his imagination must be employed in the art of communication.

Hoban, in reference to the long shot, medium shot, close-up design, writes:

The use of these three camera positions serves to bring the audience closer and closer to the object, providing a series of psychological steps of approach from the far to the near... Failure to make this approach in proper fashion leads to misconceptions, particularly among younger children, and failure to make sufficient use of close-ups in educational films is the source of frequent criticisms among teachers. The film intended for the classroom requires a much more careful use of

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orientational shots in the opening sequences than does the ordinary theatrical film in which the accent is on the actors, not on the situation in which the action takes place, and, further, the educational film requires a more abundant and careful use of close-ups.\(^4\)

Hoban's emphasis on the close-up must obviously be tempered by his reference to the importance of orientation shots, since the close-up out of context may lead to disorientation of the type he later describes in a ninth-grade class studying conservation:

The teacher reported that after the showing of *The War on Insects*, the pupils "were uncertain about the first close-ups of insects. A number of pupils expressed this uncertainty. Some of the children thought the insects were chickens."\(^5\)

Like young children, primitive audiences too, seem to require careful orientation to the close-up. The writer has in mind the reaction of a typical village audience in Anatolia which, while greatly interested in a film on malaria control, and impressed with the Anopheles mosquito shown in close-ups, doubted the veracity of the message of the film because there were "no mosquitos that big" in their village.

The importance of rendering the subject with greatest possible clarity and complete orientation has been noted by film theoreticians such as Nilsen:

The successive transition from one stage of closeness of the object to another must be based on the logic of the action or the compositional construction of the picture, when it creates a single line of influence on the spectator, from his illustrative perception of the

\(^5\) Ibid., p. 71.
long-shot to his intensively saturated perception of the close-up, through all the intervening stages of scale enlargements.6

An excellent example of this type of thinking is expressed by William Sellers, Head of the Colonial Film Unit of the British Central Office of Information, whose job it is to make films for primitive audiences in Nigeria:

In shaping their films, we must first find a point of contact within the experience of the people which will enable us to lead them from the known to the unknown. Thus when a film was requested to explain something about ocean-going liners and warships to the millions of people living in the remote inland regions of Africa, we started by showing a few ducks in a stream, suggesting that they have given man the idea of using the canoe paddle. This was followed by a visual explanation of small craft driven through the water by oars, sail, stern wheeler and screw propellers. As the stream widened into a large river the boats became larger and larger, until eventually we reached the estuary and the sea, where the greatest ships were shown.7

In practice, any given scene will normally be shot from a number of different points of view, possibly with lenses of different focal lengths. The selection of points of view, and their final arrangement then, involves a further selection and reorganization of the visual cues in the editing stage.

Basically, however, unless intelligent consideration is given to camera interpretation during the shooting of the picture, mistakes and omissions generally cannot be corrected, although skillful editing can


usually improve and deepen the significance of good photographic interpretations.

The empirical evidence on camera interpretation in motion picture production cannot be encompassed in a brief discussion. Many factors such as lighting, the choice of lenses, and the final selection of scenes in editing are involved. Here we have dealt only with the factor of camera viewpoint.

The director of the average entertainment film, like the educational film producer, must first of all strive for intelligibility. Technically excellent photography, as one of the requirements for intelligibility, is expected and demanded of all types of professionally produced films. Every film maker, too, must keep his audience completely oriented, and move it successively and logically through the stages of action. This process is not simply or solely a matter of building sequences on the long shot, medium shot, close-up formula. The producer of the educational film, especially if designed for children or for primitive audiences, however, should guard against departures from this pattern which may result in disorientation or misinterpretation.

The subjective camera angle is widely used in entertainment film production, together with a wide variety of camera movements such as dollies, and zooms, on the assumption such techniques can and do advance the idea and communicate it to the audience. The selection of these visual symbols and their integration into film form is a complicated process. The variety of such techniques has increased with the development of motion pictures as an art and a science, and they are
being increasingly used in the production of films for education where
the nature of the subject seems to require an intensified, dramatized
presentation.

5. Experimental Evidence

Three experimental studies are of interest in connection with
camera interpretation. Like many of the experimental studies reported
in this investigation, these were undertaken in connection with Armed
Forces film production projects, and deal with perceptual-motor
skills.

In 1947 Gibson, as part of the Army Air Forces Aviation Psychol­
ogy Program, studied the effectiveness of the fifteen-minute animated
film, Position Firing, in comparison with an illustrated lecture and
a specially prepared illustrated manual, in teaching gunnery to avia­
tion cadets. The film method was reliably superior to the other
devices in effecting learning, but the point of immediate interest is
that Gibson attributed much of this superiority to the subjective
camera point of view used in the film, noting that:

For long passages, the camera takes the position of the
trainee in the learning situation, seeing what he would see,
rather than the more conventional position of an onlooker
watching someone else in the learning situation. Nearly
one-third of the time spent on instruction in the film is
devoted to these passages.8

Roshal undertook a study for the Instructional Film Research
Program at the Pennsylvania State College in which he investigated
camera angle as one of four variables in eight film versions to teach

8Gibson, op. cit., p. 252.
the tying of three kinds of knots.  

His findings tended to confirm what Gibson suspected, that:

...The 0° (subjective) camera angle was superior to the 180° camera angle for perceptual-motor training. His data indicate that when the camera is placed in the position of someone actually performing the task, rather than opposite him, learning is facilitated.

A second study undertaken by the Instructional Film Research Program seems to have some bearing on the present problem. This is a study conducted by D. M. Neu to test among other things the value of attention-getting devices. This investigator found the use of certain highly improbable and "irrelevant" devices such as train whistles and pistol shots, detracted from the instructional effectiveness of the film which, in this case, happened to be one of five versions of an introductory film on machine shop measuring instruments.

Of immediate interest, however, is the fact even certain "relevant" devices, among which were included "extreme close-ups," "zooms," and "unusual camera angles" did not add to the instructional value of the film (as attention-gaining devices), and in some cases they even appeared to detract from the presentation, by calling attention to themselves.

The basic film version, using no special attention-getting

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9 Rosenthal, loc. cit.
10 Instructional Film Research, 1918-1950, op. cit., Chap. 8, p. 8.
devices proved to be superior both with Army and Navy trainees. On this basis, Neu concludes:

Where instruction is the principal aim, and cost a consideration, producers of training films should present the subject matter in a simple, straightforward way and avoid the use of such fancy and expensive devices as spot-lighting, zooms, extreme magnification, and stop motion, to gain the learners' attention.12

The limited experimental evidence available thus suggests the effectiveness of the subjective camera angle, which fact has already been noted empirically, and the importance of simplicity and clarity in the treatment of subjects which, by their very nature, appear to require nothing more than a straightforward presentation.

Summary

The twenty-two educational films in the present survey are characterized by clear, sharp photography of good professional quality. Most of the films intended for use in the elementary grades involve straightforward photographic treatments using the long shot, medium shot, close-up pattern, without striving for dramatic effect by the use of unusual camera angles, dolly shots, or special camera movement.

Many of the films in the adult list, and three in the school-film list do, however, contain special camera effects and angle shots where appropriate to the theme. The use of camera angles, in combination with effect lighting and special music is especially marked in films with a psychological theme, but is also used in other pictures, like The River, where dramatic effect is desired.

12 Ibid., p. 35.
Empirically, it is recognized that the audience must at all times be completely oriented to the pictorial symbol, especially with films produced for young children, primitive peoples, or film illiterates. Camera angles are widely used for effect in theatrical films, and the story-telling possibilities of the camera have been in continual development, technically and artistically, over the years.

The extent to which the story-telling techniques of the motion picture camera have been tested experimentally are limited to a few studies which show the subjective camera viewpoint to be desirable in films showing perceptual-motor skills, and that camera effects such as zooms, extreme close-ups, and unusual camera angles when used as attention-gaining devices, may often serve only to detract from the main theme.

The upshot of the evidence at hand seems to be that whenever a camera is put into position, an interpretation is involved. This interpretation or reconstruction of reality represented by the individual shot must first of all communicate the idea involved. This means selection of that point of view which establishes or orients the subject with relation to its surroundings, so it may be seen as a part of a whole. The medium shot and close-up may be used to amplify and intensify the subject and develop it in greater detail. This is a basic, but by no means inviolable pattern for the design of both the entertainment and the educational film.

The emphasis on the need for close-ups in films for children, expressed by some educators and by some film makers, must be tempered by the necessity for adequate orientation. In none of the school films
in the EFLA list is there an apparent dearth of close-up shots. Many early, amateurishly produced educational films, however, were lacking in medium shots and close-ups, and it is to be wondered to what extent many criticisms of educational films continue to spring from the deficiencies of pictures made in an earlier day.

The distance and angle of the camera from the subject, must, of course, be determined in relation to the intent of the scene being photographed. An appropriately selected camera viewpoint can produce visual symbols which convey information clearly, and can suggest and support emotional situations or dramatize ideas. On the other hand, when the camera is placed too far away, too close, too high, or too low in relation to the subject, communication may easily fail.

In the hands of the experienced educational film producer the camera will remain a tool, and its virtuosity will not be demonstrated at the expense of a clear, understandable visual communique.
CHAPTER VIII
COLOR

1. Evidence from the Present Study

Six of the twenty-one films on the EFLA list are in color. Two of these are in the school-film list, four in the adult group.

In The Loon's Necklace, color is used to display the ceremonial masks which are the visual expressions of most of the ideas involved in the story. In Autumn on the Farm, seasonal colors are important to the exposition of the theme. In America the Beautiful, color is used to show the panorama of scenic United States suggested by the picture title. Animals Unlimited, a nature subject, gains through the use of color which illustrates the protective and beautiful appearance of the animal life of the African jungles and veldts. In Brotherhood of Man, and Boundary Lines, color is used to show the differences in skin shades of various races represented.

While color could, of course, have been used representationally in any of the films on the list, those mentioned above are ones in which this element seems to contribute essential information. That is, color appears to be a necessary visual sign in the communication of the idea—to show "how it looks."

In three pictures, color is also used to show "what it means." In The Loon's Necklace, red is used to suggest warmth and firelight, blue to suggest night and cold, and green to suggest illness. In Brotherhood of Man, Henry's alter-ego, a green caricature figure,
symbolizes greed, bigotry, and ignorance. In Boundary Lines, red and black are used to symbolize plague and poverty.

Thus, while in six of the twenty-one films considered color is used representationally, to show what the subject "looks like," in three of these films color is also used symbolically, to give psychological impact to the scene, and to create a "feeling" about the subject.

2. Empirical Evidence

The practical problems of producing films in color are economic, technical, and aesthetic. It is generally more expensive to produce a color film than it is to make the same film in black and white, and the cost per print is approximately double. The lighting for a color production is critical, especially with reference to the temperature of the illumination used. Problems of duplication, and sound recording are also encountered.

Nevertheless, according to a recent survey, the proportion of color films made for industrial or promotional purposes increased from 58 per cent to 61 per cent between January, 1949, and March, 1950.\footnote{Trend Reports on Business Pictures,} Of 487 films listed in Coronet Films 1953-1954 catalogue, all except 33 are available in color.\footnote{Appendix G, p. 285.} Encyclopaedia Britannica Films lists 161 titles in their 1952-1953 supplement, of which 91 are available in color. The International Film Foundation has turned to color for its series of "Life in Great Britain Today," and many other com-
merial producers are making all films in color, releasing prints in both black and white and in color.

While the trend seems to be toward the increasing use of color, it should be noted that two of the major educational film producers continue to handle a preponderance of monochromatic subjects. The McGraw-Hill Text Films are mainly black and white, the 1953 listings of this producer showing only nine films in color, ten in both black and white and color, and 104 in black and white only. Young America Films is most conservative in this respect, only one film out of 130 listed in their 1952-1953 catalogue being in color (Painting: Learning to Use Your Brush).

In view of the somewhat varied approach of film makers to this problem, we might ask what functions color really serves in education.

With the exception of the approximately four per cent of men and 0.4 per cent of women who generally confuse reds and greens and are called "color-blind," our eyes are sensitive to red, green, and blue, and these colors are integral parts of our environment helping us to identify it and draw meaning from it, through the psycho-physical function of "seeing." We cannot, therefore, isolate color from the experience in which it occurs. Explaining the skilled artist's use of color Dewey says:

3 In addition to 80 black and white March of Time subjects, and 100 black and white films in the This Is America series.


...An artist uses color to define an object, and accomplishes this individualization so completely that color and object fuse. The color is of the object and the object in all its qualities is expressed through color. For it is objects that glow—gems and sunlight; and it is objects that are splendid—crowns, robes, sunlight. Except as they express objects, through being the significant color-quality of materials of ordinary experience, colors effect only transient excitations—as red arouses while another color soothes. Take any art one pleases, and it will appear that the medium is expressive because it is used to individualize and define, and this not just in the sense of physical outline but in the sense of expressing that quality which is one with the character of an object; it renders character distinct by emphasis. 6

The same general idea is expressed by Edman, who, in speaking of painting, says that "color is seldom experienced or enjoyed in isolation. It appears as a spot in a composition; it is bounded by lines; it accentuates shapes." 7

Color, therefore, can "render character distinct by emphasis." It "accentuates shapes." It does not occur in isolation, but in relation to the facts of environment. Some African tribes, for example, have been found peculiarly insensitive to color films. Sellers reports that "the only words for colours which occur in many East and West African vernaculars are black, white, and red. This may have some bearing on the fact that illiterates refer to colour film as 'the film where the sun was shining.'" 8

Personal experience as well as cultural conditioning accounts for many of our color preferences and for the qualities with which we

7 Edman, *op. cit.*, p. 85.
8 Sellers, *op. cit.*, p. 43.
associate colors, as pointed out by Burtt on the basis of a compilation of test results on the effect of color in advertising:

One person is favorably conditioned to red because of an outstanding enjoyable experience at sunset; another likes blue because it reminds him of somebody's blue eyes; a third prefers yellow because that was the color scheme at his wedding; while another might respond favorably to green because the first garment which he remembers wearing when he was taken outdoors was of that color.9

Color, therefore, is both a sign—showing what an object "looks like," and a symbol, built up through association with a variety of objects in the past—a quality inseparable from the object it "fuses with."

Photographically, the decision about whether to make a film in black and white or in color appears to depend on how much its use contributes to the significant meaning of the subject being represented. Producers strive for "true color," "reality," and "clarity." They notice that color has attention-value, and that it seems to increase the illusion of depth.10

Practically, however, we know that color film, although designed to duplicate the three-color system of the eye, cannot adapt itself as the eye does; that it does not "see" color as the eye sees it. The dyes used in such films are not exact with respect to their color characteristics. They are "fugitive." They change with time and temperature. Color films are "contrasty." As a result, the color reproduction while it may be similar to the image photographed, is

9 Burtt, op. cit., p. 256.
never identical with it. And a proportional loss in fidelity is suffered as the original film is duplicated in printing. The Eastman Kodak Company has compiled an immense amount of research on this problem without arriving at a color film system with theoretically correct sensitivities to different spectrum colors, partly because theoretically perfect dyes do not exist.\textsuperscript{11}

Although a correctly exposed, carefully printed color film approximates the original scene to a satisfactory degree as a result of the adaptation of the eye to the screen image, exaggerations in color films are widely noticed. Grass seems greener, the sky bluer, and all colors more or less saturated than they appear in reality.

An interesting reaction of an unsophisticated audience in Northern Rhodesia is noted in this connection by Tony Lawman:

It was in this area that I heard from villagers, both educated and illiterate, that they did not like colour films in which Africans appeared. They said that in colour films the African was shown to be "very black" when of course, "everyone knows he is brown." Others, of an older group, said they did not like colour films because "they are big lies"—these films showed everything in pleasing colours but in fact some things were drab, and those that were drab should be seen as such.\textsuperscript{12}

This indicates the need for careful color control in all phases of production from photography and lighting to printing, so that the best possible results be obtained. The color reproduction in the

\textsuperscript{11} Color and Color Photography. A symposium presented by The Motion Picture Film Department of the Eastman Kodak Co., Rochester, New York: Eastman House, 1950.

\textsuperscript{12} Lawman, Tony. "Information Research: An Experiment in Northern Rhodesia." Colonial Cinema, 10:60, Sept., 1952.
picture *Autumn on the Farm*, for example, is very poor in the judgment of the writer, although since the time of its production (1948) color processes have improved greatly. The remaining pictures in color on the "most-used" list, however, are uniformly good, ranging from satisfactory to excellent.

In addition to showing "how it looks," different colors may be added to monochromatic subjects for purposes of emphasis, to add clarity and to simplify the complicated, as in some Navy training films.

...It has been necessary to use color film for a clear presentation of some of the more complicated aspects of the fire control mechanisms. In one instance, it was necessary to trace visually a large number of electrical circuits in one piece of equipment. It was even necessary in some instances to combine such electrical circuits with hydraulic circuits. The problem did not end with the decision to use color, but included the choice of suitable colors against effective backgrounds, the proper separation of these colors to present effectively the intricate detail desired. Although satisfactory results have been obtained, there is a great field of experimentation and achievement in the use of color in the training film program which has not been touched upon.13

The psycho-physical reaction of the human being to color has been the subject of discussion, philosophical, aesthetic, and physical, for hundreds of years. With the relatively recent development of the color film, motion picture makers are beginning to experiment with the psychological effect of this element. The use of color as pure symbolism has been noted in the films, *The Loon's Necklace,* and *Boundary Lines*.

The literature is full of allusions to the meaning of certain

13 Evans, loc. cit.
colors, and much of this must be regarded as unscientific. There is, however, some suggestion that red is slightly stimulating, and blue slightly depressing. The red end of the spectrum is usually described as "warm," the ultra-violet end of the spectrum as "cool." Darker colors appear "heavier" than lighter colors, the important factor apparently being color-brightness. There is a tendency for lighter colors to appear comparatively larger than darker colors, brightness again being the deciding influence. Red is an "advancing" color.

The utilization and testing of symbolic color factors in motion pictures is a wide-open field. But it would seem that color, like any visual symbol, has meaning only in relation to its association with other visual clues—form and shape, as suggested by Dewey and Edman, past experiences, as suggested by Burtt, and Sellers.

Finally, Eisenstein, in discussing the meaning of sound and color says:

...We do not obey some "all-pervading law" of absolute meanings and correspondences between colors and sounds—and absolute relations between these and specific emotions, but...we ourselves decide which colors and sounds will

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References:


best serve the given assignment or emotion as we need them.

Of course, the "generally accepted" interpretation may serve as an impetus, and an effective one at that, in the construction of the color-imagery of the drama.

But the law laid down here will not legalize any absolute correspondence "in general," but will demand that consistency in a definite tone-color key, running through the whole work, must be given by an imagery structure in strict harmony with the work's themes and idea.19

3. Experimental Evidence

A few examples of research on color, primarily in the field of advertising, have been cited. Three studies which apply more directly to the use of color in motion pictures merit consideration here.

Comparing color and black and white films in the 5th, 6th, 11th, and 12th grades, Long found reliable differences in favor of color films for the 11th and 12th grades on the basis of retention tests after four and one-half months. On immediate tests, color films proved superior in the 6th and 12th grade groups. For the 11th grade group, color was superior on delayed testing, but black and white films proved unreliably superior on immediate testing.20

An earlier study by McLean, using still pictures, showed that high school seniors were able to recall colored geography prints better than black and white prints. McLean noted, however, that in some cases color seemed to distract from the meaning of the scene.

while in other cases it appeared to add to the clarity of detail.\textsuperscript{21}

VanderMeer, in connection with the Pennsylvania State College Instructional Film Research Program, used five films available in both black and white and color with two groups totalling approximately 325 ninth- and tenth-grade science students matched in intelligence, age, and sex.\textsuperscript{22} The experiment, conducted first in 1948, was repeated in 1949 using about 200 ninth-grade science students.

The results of this study showed, among other things:

1. A tendency for students to prefer color over black and white films.

2. Slightly superior results for the color films upon immediate testing; and significant superiority for the color films upon delayed (six weeks) testing.

3. Slightly superior results with black and white film in an identification test given immediately after the showing; but this superiority was lost in the results of a delayed-recall test given six weeks later.

In evaluating this study, the staff of the Instructional Film Research program reports:

The most conclusive finding of the study is that color may be more of a help in reducing the amount of forgetting than in increasing the amount of immediate learning...

VanderMeer's findings on the effect of color in presenting information pictorially are not inconsistent with the hypothesis of visual primacy. There is some evidence that, under certain conditions, the color medium increases the effectiveness of the visual presentation, and perhaps reinforces the effect of the picture. By this same line of


reasoning, it is conceivable that color may distract attention from other important learning cues, for example, material in the commentary or other visual cues in the picture. In the final analysis, it is probably a question of determining what are the crucial cues for learning. If color provides crucial cues in some learning situations then it should be used. Much research remains to be done in this area.  

Summary

In the present study, color was employed in six out of twenty-one motion pictures widely used for educational purposes by schools and in adult groups. Color was used representationally in most cases, to show the color of autumn foliage, animals, scenic views of the United States, to advance a story involving Indian-made masks, and to distinguish the color differences between the races of man. Color was also used symbolically to indicate physical conditions such as night-time, warmth, and winter, and emotionally to express sickness, evil, conflict, and serenity.

Empirical evidence on the nature and effect of color ranges from the philosophic to the experimental. But it appears to be a visual element closely and perhaps inseparably bound up with experience itself. It cannot be easily isolated from the object it invests. Consequently, reactions to colors are largely based on previous experience.

There are peculiarities of the human eye and in the way it adapts to color which also affect our perception of it. In combination with

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other colors, a given color may take on new qualities. For example, if two identical green samples are projected onto a screen, one being surrounded with a blue field and the other by a yellow field, the green samples no longer "look" the same, although they were originally cut from the same color patch. Since color film does not compensate or adapt as the eye does, and since color materials have not been developed which are capable of reproducing and duplicating natural colors with complete accuracy, the dangers of misrepresenting colored objects through motion pictures are increased, especially if poor photography and bad prints are involved.

In spite of these and other limitations, such as increased cost per print, there appears to be a definite trend towards the use of color in films. Practical film makers and educators have cited color as a means of clarifying, simplifying, and emphasizing objects, processes, and mechanisms. Under certain circumstances, color has been found to have "weight," "size," "temperature," and "distance."

But in order to accomplish its intended purpose it must be used selectively, its symbolic significance being related to other colors and to other visual cues in the situation in which it is found.

The experimental evidence on the use of color motion pictures in education, while meagre, shows that students prefer color over black and white films. The slight attention value of color probably plays a part here. This same element may also tend to distract attention from the subject matter, according to one research worker. The effect of color appears to reduce the amount of forgetting as measured by delayed-recall tests, although there is little reliable
evidence of differences between black and white and color upon immediate testing.

Experimental evidence of real stature has yet to be developed in regard to the effectiveness of color in the learning process. The existing evidence suggests what has already been found empirically, and, indeed what may be deduced from an observation of widely-used educational films in the EFJA list. This is that "if the thing to be learned (such as the identification of flowers, kinds of wood, or geological specimens) depends heavily on color, then the discriminative learning may best be done from color films. However, it would seem that there are subtle and, as yet, unmeasured distractive effects involved in instructional color films."²⁴

CHAPTER IX

ANIMATION

1. Evidence from the Present Study

The technique of animation is the technique of giving the appearance of motion to various types of static materials. Spottiswoode lists the following categories of animation:

<table>
<thead>
<tr>
<th>Two Dimensions</th>
<th>Three Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. MOVEMENT OF CAMERA AND LIGHT</strong></td>
<td></td>
</tr>
<tr>
<td>a. Panning and zooming on a flat surface like a map.</td>
<td>a. Panning and zooming over real life objects, puppets, statues, etc.</td>
</tr>
<tr>
<td>b. Moving light beams over a flat surface, and varying their intensity or color.</td>
<td>b. Moving light beams over models, sculpture, etc.; changing their color and direction.</td>
</tr>
<tr>
<td><strong>2. DISPLACEMENT</strong></td>
<td></td>
</tr>
<tr>
<td>a. Flat paper and metal cutouts.</td>
<td>a. Movement of complete objects such as plates, chairs, matches, cigarettes.</td>
</tr>
<tr>
<td>c. Moving shapes of string, thread, chain, etc.</td>
<td></td>
</tr>
<tr>
<td><strong>3. PARTIAL REPLACEMENT (ADDITIVE AND SUBTRACTIVE)</strong></td>
<td></td>
</tr>
<tr>
<td>a. Scratch-off and paint-on techniques.</td>
<td>a. Building up and paring down of blocks of clay, plasticycle, cheese, etc.</td>
</tr>
<tr>
<td>b. Chalk and blackboard technique.</td>
<td>b. Molding putty, clay, chewing gum, or flexible plastic.</td>
</tr>
<tr>
<td>c. Pencil, pastel, and paint techniques.</td>
<td></td>
</tr>
<tr>
<td>d. In and out movements of pin shadows.</td>
<td></td>
</tr>
</tbody>
</table>

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1 Spottiswoode, op. cit., p. 124.
4. TOTAL REPLACEMENT

b. Handpainted movie film (cell frame).
c. Perforated movie film (cell frame).
d. Frameless handpainted movie film.
e. Replaceable cutouts.

Naturally, not all of these forms of animation appear in the list of twenty-one most used films in the present study. Various forms of animation, however, are used in two of the school films and in four of the films on the adult list.

The River includes a sequence involving an animated map of the Mississippi River Valley which, in one of the simplest forms of "pop-on" (partial additive replacement) animation shows the location of the dams built by the Tennessee Valley Authority and their relation to the whole system of rivers flowing into the Mississippi.²

In The Loon's Necklace, ceremonial masks carved by Indians of British Columbia are, in effect, "animated" by their wearers. Coupled with art-work backgrounds by Graham Crabtree, this picture is more suggestive of pure animation than of live photography, although it might be considered a combination of the two.³ The only naturalistic photography in the picture is the final sequences which show the loon swimming in the water.

In the adult film group, we find an interesting combination of

² Fig. 5, p. 154.
³ Fig. 6, p. 159.
FIGURE 5

AN ANIMATED MAP AND OTHER SCENES FROM THE NEVER
FIGURE 6

CEREMONIAL MASKS "ANIMATED" BY THEIR WEARERS IN THE LOON'S NECKLACE
live photography and animation in the film, Overdependency, where cartoon illustration of the digestive tract and nervous system is overlaid on a "hold frame" shot of a psychiatric patient as the psychiatrist explains the physical reactions of the body to mental unrest and tension. In the same picture, a dream sequence is developed through multiple superimposition of live photography and art-work background. The animation in this case is done by the well-known artist, Norman McLaren.

In Human Reproduction, as with Overdependency, animation is used to illustrate body functions not observable in actuality. The cycle of the female reproductive organs, for example, is shown in simplified form which is more clear and in a sense more "realistic," than live photography could show it. A number of simplified forms of animation are represented in this picture, including a series of drawings of various stages of the development of an embryo, connected with dissolves; titles and arrows which "pop-in" as organs or parts are mentioned; and overlays, such as a series of numbers representing days, rotating over drawings of stages in the menstrual cycle, and a transparent ruler used to show the relative size of the human ovary.4

In Brotherhood of Man we find an example of cell animation done by a group of artists who worked for Disney and later in Army and Navy film production.5 The drawings are fundamentally isotype in style, and according to the National Board of Review Magazine, treat

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4 Fig. 7, p. 159.
5 Fig. 8, pp. 160-165.
FIGURE 7

ANIMATION TECHNIQUES IN THE McGRAW-HILL FILM, HUMAN REPRODUCTION
PICTORIAL (CELL CARTOON) LAYOUT FOR THE FILM, BROTHERHOOD OF MAN
the touchy subject of racial prejudice with a:

light-hearted human approach... so emphatically successful that it doesn't have to be propagandistic or hortatory. It securely builds the facts into its narrative, but it singles out the things about people that interest, attract, or repel other people. It dwells on these things as Disney himself might, as Chaplin might, and thereby speaks the universal language of which they are masters. It would be understood anywhere, and felt with anywhere. And its marvelous little characters are suffused with the warmth which the word "brotherhood" gives out in any language.

Boundary Lines is perhaps the most stylized form of animation found in any of the examples studied. It was planned, written, and drawn by Phillip Stapp. The cue to its form is expressed in the opening sequence where we see an abstract line forming on the screen, then becoming whatever, in our own perception, we choose to make it:

This is a film about the imaginary lines which divide us as people from each other.
What is a line, anyway...
Except what we make it?
A line can mean water...
Or mountains...
Or tree... or man.
A line can mean light...
Or love... or yes...
Or no... or perhaps...
A line speaks any language and
This line could mean many things...
A ball... or balloon...
Or the whole wide world.
You see, a line is what we make it...
Because...
A line is only an idea.

Boundary Lines is distinguished by its use of static drawings linked by dissolves which effect the appearance of progressive motion. It is also marked by a rich variety of camera movements imbuing static

frames of art work with dynamic quality. Conventional use of single-frame animation technique is also found in this film.

Among the most used films in the EFLA list we thus find animation being used to illustrate spatial relationships (The River), for artistic story-telling purposes (The Loon's Necklace), in combination with live photography to show functions of the body which are too complex and difficult to see in live photography (Overdependency and Human Reproduction), and in the treatment of abstract ideas which probably could not be as simply, succinctly, and artfully handled through live action (Brotherhood of Man and Boundary Lines).

We find several types of animation, ranging through the relatively simple type used in the map treatment in The River, the cyclical type found in Human Reproduction, the somewhat more expressive type of treatment by McLaren in Overdependency, the isotype-quality of Brotherhood of Man, and finally the imaginative, avant-garde approach of Boundary Lines. All these forms are presumably meaningful visual cues, or are at least widely acceptable in the adult field. In each case they are skillfully, professionally handled, and appropriate to the theme portrayed, doing a job which could not be easily done with live photography.

2. Empirical Evidence

Single-frame motion picture photography, the basis of animation, was used at an early date by Méliès in France, and by Stuart Blackton in the United States. Emile Cohl, who had produced several films with animated puppets as early as 1905, is generally credited as the origin-
tor of animation as we know it today, however. In the United States, Winsor McCay’s film, Gertie the Dinosaur, and Pat Sullivan’s Felix the Cat were the forerunners of the art which Disney later brought to a high peak of refinement. Animation, therefore, is not a "new" technique, but an old one which has been put to new uses.

Professional opinion is that while the cartoon form is an admirable vehicle for pure fantasy and the exposition of free-form, it can also be more credible than live photography, "more real than real."

The cartoon film...although it forms the first clear break with the world of actuality...can enforce a credibility of its own. Thus a film of Walt Disney may be more naturalistic than a film of Paul Rotha. 7

Parallel to the difference in philosophy between a photograph and a caricature, live action can show superbly how things look, whereas animation can show what they mean. Taking off from physical reality as a starting point, animation can project a point until it actually becomes "truer than truth," as is exemplified in Disney’s film, Jet Propulsion, wherein the conventional airplane dissolved into a giant bit that visually "bored" its way through a materialized atmosphere. 8

The fact that ideas once impossible for the screen can be simplified through animation impressed professional film makers who turned to the cartoon technique during the war period.

Film units in the Armed Forces, and many professional studios producing educational films of infinitely varied subjects, soon discovered that, within the medium of film, animation provided the only means of portraying many complex aspects of a complex society. Through animated drawings artists were able to visualize areas of

7 Spottiswoode, op. cit., p. 23.
life and thought which photography was incapable of showing.\(^9\)

The cartoon form which had been used at first to show processes such as the circulation of the blood, sound-waves and their sources, the operation of a gasoline engine, and the like, was put to more dynamic use as its possibilities for arousing the emotions became apparent. Disney made *Victory Through Airpower*. The Germans used maps as a core of some of their campaign films. Kracauer, in his discussion of devices used in the *Nazi propaganda films, Baptism of Fire*, and *Victory in the West*, says:

Within the visuals, much use is made of the fact that pictures make a direct appeal to the subconscious and the nervous system. Many devices are employed for the sole purpose of eliciting from audiences certain specified emotions. Such effects may be obtained by means of maps... These maps accompany not only the strategic explanations, but appear whenever symbolic presentation is called for and can be considered the backbone of the two campaign films. They stress the propaganda function of the statements about strategic developments inasmuch as they seem to illustrate, through an array of moving arrows and lines, tests on some new substance. Resembling graphs of physical processes, they show how all known materials are broken up, penetrated, pushed back and eaten away by the new one, thus demonstrating its absolute superiority in a most striking manner. Since they affect all the senses, they are bound to terrorize the opposite camp— at least so long as the tests have not been invalidated. In addition, these tests are performed on expanses that resemble areas seen from an airplane— an impression produced by the camera always panning, rising and diving. Its continual motion works upon the motor nerves, deepening in the spectator the conviction of the *Nazi*’s dynamic power; movement around and above a field implies complete control of that field.\(^10\)

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The same techniques of animation used to make a map take on a menacing or threatening appearance were used to make the malarial mosquito and the cancer cell personalized symbols of disaster in films depicting the body's fight against disease made by Disney and others during the war.

In the opinion of film makers, therefore, the animated film is useful to "solidify the intangible"; "visualize the invisible"; animate the inanimate; re-create physical objects which are extinct, inaccessible to the camera, or in the future; broaden the personal and generalize the specific; characterize and symbolize an object, force or idea; and distill and simplify processes.\(^{11}\)

Educators of experience tend to agree that animation has value. Hoban, for example, says: "Free play of imagination in the theatrical cartoon is turned in the school film to profound intellectual inquiry, and Superman's X-ray vision is the possession of every child within sight of the classroom screen."\(^{12}\) McKown and Roberts express an attitude widely held towards the cartoon film when, in referring to the films Roots of Plants and Atomic Energy, they write that "animation helps to explain processes that cannot be presented for study in any other way."\(^{13}\)

On the other hand, both professional film makers and educators express caution with regard to the use of animation, the former for

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\(^{11}\) Palmer, \textit{op. cit.}, pp. 27-29.

\(^{12}\) Hoban, \textit{Focus on Learning, op. cit.}, pp. 15-16.

\(^{13}\) McKown and Roberts, \textit{op. cit.}, p. 205.
economic and technical reasons, the latter for reasons based on sound pedagogy.

Spottiswoode refers to the technique as "a good servant but a bad master," and Hoban makes a point regarding cartoons which seems to be equally relevant to all types of motion pictures for education:

Observation of young children's responses to cartoons indicates that cartoons are vividly appealing, but that they do not need to have much meaning to the children in order to be enjoyed. The comic antic of the characters and the movement of colors on the screen are highly entertaining. In education, however, it is the meaning, not simply the entertainment, that is important. This is not to depreciate the value of emotional experiences—releasing, pleasant and satisfying—in education, but to point out that these pleasant experiences are not necessarily related to the objectives of education simply because they are enjoyable.

Finally, there appears to be a trend towards the development of films which combine live action and animation, where a combination of realism and simplification or amplification of the realistic is logically required.

Speaking as Director of the Educational Film Division of Walt Disney Productions, Carl Nater, referring to the use of live photography vs. animation, had this to say:

A direct demonstration of the fact that the two media are complementary rather than competitive appears in a film now current in the schools. Titled Jet Propulsion, the film alternates between live-action, to show what the jet plane actually looks like on the ground and in flight; and animation, to make clear the principles on which it works. The result is more effective than it would have been had either medium been used exclusively.

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15Hoban. *Movies that Teach*, *op. cit.*, p. 90.
Hubley and Schwartz suggest that where an extremely impressive statement of reality is required that cartoon or live photography alone might not be adequate and that "...it might then be advisable to use a combination of photography and animation, the photography to state the facts of outward appearance and the animation to illustrate the inner construction, or comments upon the subject, or to suggest emotional reactions of the subject."\(^{17}\)

This technique is illustrated in *Human Reproduction*, and is especially notable in *Overdependency*.

While animation, in its many forms, is highly regarded as a potential educative force both by film practitioners and by teachers, there is considerable feeling that "the serious danger to its future utilization is, paradoxically, that it will be used too much; more specifically, that it will be used outside of its proper area," and that "animation is no panacea."\(^{18}\)

3. **Experimental Evidence**

Experimental evidence on the effectiveness of animation is limited to comparisons of the cartoon film with lectures and printed materials. Even here, the investigators have difficulty isolating the cartoon form from other elements such as color and music, for example, both of which are closely integrated with the visual element in the better cartoon film.

\(^{17}\) Hubley and Schwartz, *loc. cit.*

\(^{18}\) Nater, *op. cit.*, p. 15.
An example of the difficulties of multiple-factor analysis is that while the Navy discontinued its cartoon series as "ineffective," it was not the technique of animation itself which was responsible for this decision, but rather the fact that comic antics of animated comic characters were used in an attempt to get across fundamental military lessons. Humor was the issue, not the cartoon form. Negative suggestion was also involved in some cases, as for example, the "Snafu" series.

Experimental comparisons of the animated cartoon and other materials exist in the studies of Gibson; Richardson and Smith; and Hovland, Lumsdaine, and Sheffield.

Gibson found an animated film built around a cartoon character named "Trigger Joe," superior to an illustrated lecture and an illustrated booklet in teaching position firing to aviation cadets. However, he interpreted the effect of the film more to the use of the subjective camera angle, and to the dynamic quality of the presentation than to the cartoon form.

Disney cartoons on health produced more learning and a higher degree of enthusiasm than printed pamphlets when used with junior and senior high school students in a study by Richardson and Smith.

Hovland, Lumsdaine, and Sheffield found that while their test audiences liked cartoon films featuring "Snafu," subsequent reactions,

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20 Gibson, loc. cit.
secured by means of questionnaire, showed a decrease in interest and provoked comments suggesting that the comic cartoon was out of keeping with the fact that soldiering and war is a serious business. The implication is that in these cases, the use of animation in humorous cartoon form, was inappropriate for the intended audience under the prevailing wartime condition.

While the research suggests that "the lasting effectiveness of comic cartoons as a teaching device in motion pictures is open to serious question," and that "there may even be an over-simplification which leads to confusion." the fact remains that we do not have sufficient evidence on these points.

We have, for example, no studies using alternate versions of the same film to compare the effectiveness of live photography vs. animation. It is unlikely that such studies could be completely validated in view of the fact that each version--live or animated--could take a great variety of rich visual forms, and since live photography and animation each have rather definite limitations as visual communiques, and are in a sense, incomparable.

Obviously, if live photography is satisfactory for showing what a script calls for, it seems unnecessary to go to the time and expense entailed by animation. Research is perhaps needed less in

23. See Johnson's analysis, page 15, the present study.
25. Instructional Film Research, 1918-1950, op. cit., Chap. 8, p. 17.
comparing live photography vs. animation, than in the development of simplified and inexpensive forms of animation which serve as effective visual communiques.

Summary

Techniques of animation, progressively developed through the years, have been brought to a high order of refinement by film practitioners like Disney, McLaren, Stapp, Hubley, and others, who have designed simple, entertaining, artistic films embodying ideas of undoubted significance.

In six out of twenty-one widely used educational films included in the present study, some form of animation is employed. These range in type from the comic cartoon form (Brotherhood of Man), to combinations of live photography and animation (Overdependency).

With the exception of a few studies on the cartoon, experimental evidence on the educational effectiveness of various forms of animation is lacking. Educators, nevertheless, while aware of the dangers of oversimplification, are also sensitive to the potential of animation for a variety of worthwhile purposes.

Among other educational values attributed to the technique of animation are the following:

1. Animation makes it possible to show what it is impossible to reveal through live photography.

2. We can, through animation, not only show "how things look," but also "what they mean."

3. Animation makes it possible to generalize the specific.
4. It is a vivid and appealing form.

5. It can distill and simplify processes and ideas.

6. It allows free play of the imagination.

The true educational significance of animation is perhaps in the elimination of unnecessary detail, in the high degree of control and selectivity involved, and in the simplification, amplification, and dramatization made possible thereby. This possibility is considered, too, by investigators in the Instructional Film Research Program at the Pennsylvania State College, in reference to the animated cartoon:

Possibly the problem of realism and the hypothesis of "crucial cues" also enter into the discussion of the value of animated cartoons in instruction. An animated cartoon contains only the "essential" form and detail in both foreground and background, and makes no attempt to portray a situation with fidelity of representation. Not only is much detail omitted, but the crucial characteristics of appearance and behavior are often exaggerated. If it can be assumed that the instructional effectiveness in the animated cartoon is due, in part, to its adaptability for presenting crucial cues, then the importance of striving for fidelity of representation in instructional films is... open to question.26
CHAPTER X

MUSIC AND SOUND EFFECTS

1. Evidence from the Present Study

Music and sound effects, while integral parts of every entertainment film, have received little attention as factors in educational film production. There is no important experimental evidence on the contribution of these elements in improving the effectiveness of the teaching film. It seems reasonable, however, to investigate the possibility of music and sound effects as audio symbols which, in a motion picture, may be introduced selectively to support, reinforce, and amplify the visual elements to which they correspond, and thereby make the film experience more vivid, and perhaps more memorable.

In the group of twenty-one widely used educational films included in the present study, sound effects are used in all but one, and music is found in thirteen. Six of the films in the group of nine listed as most used on the school level, contain no music, although all except Gray Squirrel include sound effects. In the films on the adult list, all except two contain music, and all have sound effects.

Environmental sounds are used more extensively than music in the films designed for the elementary level. The mooing of cows, the peeping of baby chicks, and the rattle of the farmer's wheelbarrow are heard in Adventures of Bunny Rabbit. In Colonial Children, background noises are used, including the sound of an old flintlock being fired. In Autumn on the Farm, we hear the sound of a silage-cutter, a
tractor, the squeaking of a chipmunk, and the gobbling of a flock of turkeys. In *Common Animals of the Woods*, natural sounds such as the slapping of a beaver's tail are heard, and the same is true of *Farm Animals*, where the sounds of horses, cows, pigs, goats, and sheep build up the reality of life on a farm.

The three films on the school film list, in which music is used, were not specifically produced for school audiences.

*The Loon's Necklace* begins with title music which introduces the theme and establishes audience "set." Throughout the film we hear, at various times, the call of the loon, the wailing of women in the starving Indian village, tom-toms, laughter, the howling wolves, the twang of Kelora's magic bow, and the chanting of his sacred songs, birds, frogs, crickets, the amplified hum of a mosquito, wind and thunder, and the bubbling of water as Kelora rides beneath the lake on the back of the loon. This rich texture of sound effects is expertly matched with symbolic picture elements. For example, the howling of the wolf is paralleled by a zoom-in shot of a wolf's mask; drum-beats are accompanied by a zoom-in of a famine mask, dissolving in over a long shot of the desolate Indian village. These effects make for reality. But they also operate symbolically, to deepen the emotional tone of the production.

Music and sound effects in *Land of Liberty* are used in traditional Hollywood style, to establish audience "set," to contribute to the illusion of reality, and to reinforce emotional scenes. Music

\[1\text{Fig. 9, p. 177.}\]
FIGURE 9

THE "FAMILY" MASK ZOOMS IN, SYNCHRONIZED WITH SWELLING DRUMBEATS IN THE LOON'S NECKLACE
passages occur principally as "bridges," or transitional segments between sequences, or for punctuation as, for example, when British troops enter to dissolve the Virginia Assembly. Much use is made of music having high symbolic value for the period of Revolutionary America. Variations on "Yankee Doodle," and "My Country 'Tis of Thee" are used for each of the purposes mentioned above.

Virgil Thomson's music in The River is indigenous to the theme of the picture itself. It is not added to the film, but is drawn from the film, and was actually written largely while the picture was in the shooting stages, during which time Thomson worked with Pare Lorentz, the producer. This procedure is in contrast to the common method of writing film music "to fit" photography already completed and edited.

The music of The River is based largely on old American folk and spiritual tunes—the music of the Mississippi. In describing his work, Thomson says:

It is hymn music of the kind known as white spirituals; which is to say, the ancient Scottish and Irish tunes that our Southern and Western forefathers learned in the rural districts of the British Isles and brought with them to this continent as their musical heritage...

These white spirituals are not a rare or antiquarian music, but the normal and ordinary music of the rural South. The so-called Negro spirituals are their offshoots, as are the cow-boy songs of the West. Their chief repository, "The Sacred Harp," sells a half million copies per annum, year in and year out.2

Although his orchestrations are distinctive and colorful,

Thomson makes full use of the musical stereotype, as his own description of the music in this picture shows:

"How Firm A Foundation," or Convention - Introduction, also Finale of TVA dams.

"My Shepherd Will Supply My Need," or Resignation - Scenes of the big river, also interior scene of sharecroppers' house.

"Rose of Alabama" and "Carry Me Back to Old Virginny" - (the original, though not the best known version) - cotton picking and the steamboats.

"What Solemn Sound the Bar Invades," or The Death of Washington - Civil War Aftermath.

"Hot Time in the Old Town Tonight" and "The Eagles They Fly High in Mobile," or Captain Kyd - Logging and industrial sequences.

"When Gabriel's Awful Trump Shall Sound," or Mississippi floods.

"Go Tell Aunt Rhody the Old Grey Goose is Dead" or "Savior, Visit Thy Plantation" or Importunity - eroded land.

"Yes, Jesus Loves Me" and "There's Not a Friend Like the Lowly Jesus" - Poor white cotton picking.

"Rose of Alabama," "Old Virginny" and the "Hot Time," are of course, not folk songs at all but extremely successful popular ditties whose words and music happen to be well-married.3

Words, sound effects, and music are happily married in The River. The sound of a banjo is part of a background score that includes booming steamboat whistles, and noisy buzz-saws. A tree falls under the woodsman's ax to the roll of a snare-drum; the quiet dripping of an icicle grows steadily louder, amplified by kettle-drums which finally rise in crescendo until they symbolize the pounding and eroding of

3Ibid., pp. 24-25.
the earth under the pressure of uncontrolled waters.

Repetition, an important element in this picture, occurs not only in the visuals, but also in the commentary and in the music. The sound of horns over a long pan shot of virgin wilderness is repeated off-key as a similar pan shot of devastated woodlands is shown to contrast the way it was and what man has done with his country's natural resources. Such musical repetition serves as a reminder. It also broadens and deepens meanings, as in the example above, where it reminds us of an idea which conflicts with the screen image. Music can suggest discord by being discordant, can subtly show incongruities which would be clumsy to handle with words. Irony is one of the important potentials of screen music.

The River is an example of how sound effects and music may be "orchestrated." Neither is an imitation of the other. Yet, regardless of how they are produced, the aural symbols in this picture, sometimes natural, sometimes musical, are succinct, understandable, and completely integrated with other verbal and visual symbols, so that it is virtually impossible to discuss one element without discussing all the elements which constitute this completely unified production.

The impression given by this picture is one of great feeling and depth through skillful combinations of audio-visual symbols. The popularity, if not the effectiveness, of The River is attested by the fact that it appears both on the EFLA most used list of films for schools, and on the list of films most used by adult groups.

No music is used in the two McGraw-Hill productions, Learning to Understand Children (I), and Broader Concept of Method (I). These are
intended for teachers in training and the producer apparently felt music to be unimportant, although both pictures are story-type dramatizations where music would normally be expected.

In three pictures on the adult list, music is used only to establish “set.” In Human Reproduction, we hear title music only. Novelty music symbolic of childhood is used both at the head and tail of Children's Emotions. This picture, however, includes a sequence showing how strange noises affect the child in which are variously heard the sound of shouting, running water, fire sirens, a brass-band, loud laughter, and the rumble of a locomotive. These are natural sounds used representationally, but in a context designed to simulate the feelings of a child as he encounters the new and strange. That is, sounds are used symbolically, to give depth to the representation.

Animals Unlimited has only head and tail music, but is notable for the inclusion of natural sounds—night sounds of the jungle, the laugh of the hyena, the chattering of monkeys, etc. Here, sound is used realistically, effectively, with little apparent necessity for amplification or further dramatization through the addition of music. The use of color picture signs of high interest value, together with the strange, exciting, and often ominous noise of African wild life makes this a well integrated presentation on the representational level.

Robert Fleming's music in Overdependency, while somewhat heavy-handed and obvious, is used to establish emotional tone through sustained chords and appropriate bridges. It is representative of a kind of musical treatment commonly used to symbolize inner thoughts.
and feelings throughout the whole cycle of psychological-psychiatric films of recent years.

Fleming is also responsible for the music of Feeling of Hostility, where he shows more restraint in his orchestrations, and where a closer synchronism between the musical and pictorial symbols appears. A full orchestration is used for opening and closing music and for certain key scenes—to symbolize the death of the father; Clare's resentment against her mother's suitor; her emotional reaction when she finds her gift to the teacher rejected.

In Angry Boy and Preface to a Life, music is similarly used to express moods. Tommy's surprise and fear when caught in the act of stealing is suggested by a music "bulge," in Angry Boy. Karol Rathaus in his music for Preface to a Life, underscores a child's fear of the night; the fun of a playful boxing match. And he devises a musical yawn to match that of a sleepy child on the screen.

Music written to animated cartoons is often called "mickey mouse music." This is novelty music, broadly conceived and played to accent and underscore the line or form of the screen portrayal. The music of Paul Smith in Brotherhood of Man from the time when Henry, the protagonist, hits his head on a Chinese gong, is designed to underscore the movement of the film. We get no vital clues to the deeper meaning of the scene in this music, yet it expertly reinforces what we already see and know.

For example, in the last sequence in the picture, we see men of all races stumbling along, going in the same direction, but out of step. Gradually, however, all come into step, turn, and stride firmly into
the camera. The music simulates the stumbling rhythm, gradually moving to a strong, uniform tempo as the idea of unity and cooperation develops on the screen. The music does not tell us something we do not know but rather reinforces the visual and gives it emotional lift.

An example of a different approach to film music for the cartoon form is found in the work of Gene Forrell in "Boundary Lines." Forrell's orchestrations are characterized by the selective use of solo instruments and by unusual arrangements for small groups of strings, woodwinds, and brass. Music and "sound effects" are inseparable in much of his work. There is a tendency to "mickey mouse" in some places; to underscore the action in the manner of the conventional cartoon. Generally, however, the abstract form of the visual element of "Boundary Lines" is paralleled and inter-woven with the music and sound effects of this film. A chorus of voices, for example, is used to repeat and emphasize the narrator's comment: "Boys will be boys." The result is an ironic musical commentary on how small differences between youths become big differences between men, and cannot be explained away by a pat phrase.

Music and sound effects, therefore, not only represent, underscore, and reinforce the visual impact of this film, but also, at points, provide the principal clue to the meaning thereof.

In contrast to the films previously mentioned, "America the Beautiful" contains music throughout the picture, rather than only at key intervals. This continuous "background music" agrees with the already obvious content of the scenes, and, except for the use of
"America," is rather non-committal. Typical of many educational, documentary, and films for business and industry, the music of America the Beautiful is used to fill in pauses in narration, to keep in step with the picture, but is at the same time, designed to be as unobtrusive as possible. It tells us what we already see on the screen.

In a group of twenty-one widely used educational films, therefore, music and/or sound effects of great variety and styles are used for three general purposes: (1) to supply naturalistic aural background parallel to the visual-verbal images; to underscore and emphasize what the audience has already been told in words and pictures (America the Beautiful, Human Reproduction, Farm Animals, Colonial Children, Common Animals of the Woods); (2) to deepen the emotional meaning of the words and pictures; to establish a mood or "set"; to add further significant interpretation to what is already known (The Loon's Necklace, Land of Liberty, Children's Emotions, Overdependency, Angry Boy, Preface to a Life, Brotherhood of Man); (3) and to serve as key symbols; to supply meaning where verbal and visual symbols alone do not adequately suggest the primary meaning of the scene (The River, Boundary Lines).

These purposes are not mutually exclusive. Any one film may require the use of sound and music for each of these purposes at different points in the presentation. Also, the absence of music from most of the films in the school-film list has been noted. The main point of interest here is that, as with other production elements, we find a rich variety of combinations of aural elements, ranging from
the film, Gray Squirrel in which neither sound effects nor music is used, to The River and Boundary Lines, in which these elements are key symbols.

2. Empirical Evidence

Musical accompaniment has been used with motion pictures almost from the beginning. Lindgren reports that during the first showing of Lumiere films in this country in 1896, improvisations on popular tunes were played. In 1909, the Edison Company set an example, soon followed by other early producers, of publishing a music cue-sheet indicating the various moods of the picture as "lively," "sad," and so on. Special complete scores were written for early classic films like Berlin, The Birth of a Nation, and Battleship Potemkin. According to Ernest Lindgren, the music of the latter was so effective it was banned in some European countries, although the picture portion was shown uncensored.

The development of sound recording on film opened the door to the unlimited use of both sound effects and music, and inevitably to abuses. Music was allowed to conflict or over-ride narration and dialogue, and an over-abundance of sound effects was often used, proving little more than the technical capabilities of newly developed sound recording and re-recording equipment and the virtuosity and growing authority of the sound engineer.

In many films, and especially in low-budget educational and documentary productions, "canned" music had to be used with the conse-

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quent reappearance of cliché melodies which seldom supported the visuals, but which did serve to fill in the unmodulated portions of sound track and cover up objectionable audio interferences such as line-hum, amplifier hiss, and other "frying" and crackling noises, many of which still interfere with classroom projection.

Yet, because music, and sound effects were felt to be closely allied to movement, form, and mood, their creative use in films was a natural and almost inevitable development. The reasons for this lay halfway between the fields of philosophy and psychology, and although no thorough survey of this wide and controversial area will be attempted here, a few clues might be mentioned. Edman, for example, says:

...Music retains, even in its complex forms, a quality lyric and personal, an echo or an approximation of the human voice. The violin sings and all music is thinkable as a kind of complicated singing. All that direct and unmistakable personal address which is native to the human voice is indigenous, too, to most music. There are sounds, too, in music that recall characteristic moods and crises in our nonmusical experience. It may be thunderous or plaintive, frightening or soothing, like analogous sounds of those moods in ordinary life. There is indeed a cheap kind of musical exploitation of effects of Nature in music and instrumental onomatopoeia, in which the crash of thunder, the singing of birds, the ripple of water, the bleating of sheep may be imitated. But it is not by such imitation that the subtlest emotional effects of music are contrived. Rather the movement of a melody, though it says nothing specific, in some unspecified way awakens a whole reverberation of nervous responses. In real life, our emotional responses tend to go over into action, or to become absorbed by some object. In music, the sounds that provoke some reverberant response are the only objects upon which that response can be made. The very music that rouses us appeases us; in the sounds that give us stimulation we find our peace.6

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Edman points out that while music is no substitute for the specific symbolism of language, it can express with great meaning and depth, those non-specific relationships which cannot be fully expressed in words.

Words are too brittle and chiseled, life too rigid and conventional to exhaust all the infinity of human emotional response. The infinite sinuosity, nuance, and complexity of music enable it to speak in a thousand and different accents to a thousand different listeners, and to say with noncommital and moving intimacy what no language would acknowledge or express and what no situations in life could completely exhaust or make possible.7

All this is well understood by the serious composer of film music today. The better Hollywood film music is presently designed to add emotional "color" to the visuals, rather than to simply echo what is already obvious from the screen. Although films still continue to use representational, thematic scores, a different type of thinking is manifest in the industry, sometimes a result of changing concepts of film structure accelerated by the wartime period. Jack Shaidlin, for example, formerly music director of the wartime government film agencies in the O.E.M. and the O.W.I., and later for March of Time, has this to say:

During the war those of us who scored factual films discovered opportunities for unusual or subtle scoring of a kind far different from story-film scoring. Instead of the ready-made dramatic situation to be stressed or echoed in music, we had to discern dramatic values implied by the film. Especially in films cut from stock scenes, the music unifies and moves material that often has no other element to give it pace and color. Sometimes in my scoring of March of Time films I replace an

7 Ibid., pp. 108-109.
A good piece of music with one less dynamic to avoid diverting the attention of the audience, as I believe background music in this type of picture should be felt rather than heard.

It is obvious to the musician, as it was to the early film exhibitor, that music can be distracting, can defeat the purpose of the picture as well as support it. Music, inappropriately used, or used where not required, detracts from the effect of the film just as other elements of a presentation, such as introductions and summaries, optical effects, color, and the like, can be distracting if they are contradictory, irrelevant, or unnecessary to the main theme.

This means that music must be used selectively, in terms of its contribution to any particular scene, or sequence. The same is true of sound effects. The microphone, like the ear, must be selective. All "coloristic" music is of this type. It is selected to arouse direct association much in the way incidental sound effects—the ringing of a locomotive bell, or the howl of an air-raid siren—arouse direct associations. It is also characterized by its attempt to develop an emotional tone. It is sensuous or exotic in character, and to achieve the desired effect, we use is often made of special instruments such as the Novachord, the Theremin, and the Hammond organ. Examples of "coloristic devices" used in current films include Max Steiner's use of a backdrop of airplane motors under a military band in *Dive Bomber* and Miklos Rozsa's use of contradictory chords and static harmony in *Lost Weekend*.

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Coloristic music is generally intended to be subordinate to the visual and verbal elements in the picture. It is supposed to be subliminal in effect. It is designed, as Schaimdlin put it, to be "felt rather than heard." Or, as Dore Schary expresses it:

Fundamental expressions of universal emotions sometimes drop below the level of a verbalization, and there the film can speak in the universal of music. Music can heighten the significance and broaden the scope of great scenes, and may even add to a mediocre scene an importance which was lacking in the unscored version. We may depend on music to guide the audience's mood economically, using a single chord or short phrase to replace several feet of a scene. We expect music to point up action, enrich emotions, bridge transitions, and particularly to weave the whole picture into unity with thematic threads of musical continuity.\(^\text{10}\)

And Alfred Newman, music director of 20th Century-Fox, is reported as saying, in regards to film music: "If it is good, you won't think about it, but you'll feel it."\(^\text{11}\)

It is admittedly difficult to estimate with any reliability the function of music, so conceived, in terms of the educational film. The addition of music to teaching films may not add informational content, but we need to know more about the subliminal effects of such music and how they may be achieved if desirable. A few examples of how film music is derived by the practitioners are of interest in this connection.

Bronislau Kaper, music director for M.G.M., and author of the music for The Red Badge of Courage, is reported to have explained his


work on this picture as follows:

After the Youth's regiment wins the first battle, the soldiers act happy...but I come along, and I tell the audience, with sad music, what is so good about this? I make a little ridiculous the whole idea of one American killing another American. Sometimes I bring phony emotions into the picture to wake the audience up. Other times, on a closeup, I stop the music. Some of the scenes are too punchy. I must bring them down. The music provides the sustained mood that will give the picture continuity and smoothness...

I play the Tall Soldier's death by letting his breathing be the soloist. The music is the background to the breathing. When he dies, there is a sudden silence. No music. No comment. I give the audience a chance to make its own comment. The second death, as the Tattered Man wanders down the hill to die, with the Youth following him, I play with two instruments only. A trumpet, for the military death, and a harmonica—a gay tune—to show the irony of it. In the letter writing scene, I said to John Huston, "It is important not to get sentimental. The Youth is writing a letter home." "The boy is afraid," John said, "and it is funny." I said, "I don't know how to score him as funny." John said, "He shouldn't be treated tragically. He is a little ridiculous." Then he said, "Banjo!" A stroke of genius! We have a funny sound coming from the outside while the Youth sits in his tent and writes. A funny sound to a sad situation. In this way, we give a story to the picture. It is musically interesting when the boy runs away from the battle. I play the fears inside the boy. The music is spasmodic. Like a heartbeat. The entire prologue of the picture, a short scene, showing the Youth on sentry duty, will be silent. No music can be as loud as silence.12

The variety of uses to which he puts his music is interesting in the comments of this music writer. He uses it "to wake the audience up," to "give the picture smoothness and continuity," to broaden meanings, to "give a story" to pictures which, in themselves do not convey the meaning of the situation. He uses natural sounds as a basis for

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soma Interpretations. The breathing of the dying soldier is "the soloist," and the music representing the boy's fear is spasmodic—"like a heartbeat." And he uses silence as a sound effect.

As we move further away from "background" and "coloristic" music towards music which is expected to serve as the principal cue in any given sequence, it becomes clear that more room must be made for this music by the elimination of dialogue and by subduing the visual impact. In other words, the producer must find, at any given point, the proportion of picture and sound which will most sharply illuminate the meaning of the particular scene. This is the process described by Kaper above, and by Flaherty below:

Our sound tracks are as much an exploration as our visuals are. In Man of Aran we told the story with the camera. Bits of dialogue post-synchronized were put in after the film was made as incidental sounds, and not to motivate the story. It didn't make any difference whether the dialogue was understood or not—as a matter of fact most people didn't understand it. So here was a film that offered a clear field for the composer, and we feel that Man of Aran is a musical rather than a prose form, since music and not words is used to motivate the story. The music, by John Greenwood, was based on Aran folk songs from a sound track we made of Maggie, who played the mother in the film, singing them.

In Louisiana Story we saw to it that the composer, Virgil Thompson, would be able to see the film in its first rough cut and have plenty of time to explore the music which, as in Aran, was the folk music of the people in the film. Here again music has done more than words to motivate the story; Louisiana Story has gone a step further in welding music and film together. And we feel that this is only the beginning of wonderful things that could be done in the future with composer and film-maker teaming up and working together. Because music and film have movement, whereas words tend to slow movement up. And movement, we still feel, is the essence of good film as a form of art.13

The use of music in documentary film productions such as those mentioned above, contrasts with the use of this element for purposes of deliberate distortion in Nazi propaganda films.

A conspicuous role is played by the music, particularly in *Victory in the West*. Accompanying the procession of pictures and statements, it not only deepens the effects produced through these media, but intervenes of its own accord, introducing new effects or changing the meaning of synchronized units. Music, and music alone, transforms an English tank into a toy. In other instances, musical themes remove the weariness from soldier faces, or make several moving tanks symbolize the advancing German army. A gay melody imbues the parade and decoration scene in Paris with a soupçon of "la vie parisienne." Through this active contribution of the music the visuals affect the senses with intensified strength.14

In the previous examples, music has been used representationally, "coloristically," and in certain cases, as the key symbol in a given sequence, imparting to it a core of meaning not evident from the picture or verbal portions alone. The effectiveness with which sound effects and music might be used in any given teaching film would depend, of course, on a number of other factors, the principal ones being the subject matter of the film itself, the age and grade-level of the audience, and the ability of its members to interpret the aural symbolism involved.

A recent survey by Children's Entertainment Films, a J. Arthur Rank organization, undertaken in cooperation with the British theatre managers showed that:

> Natural sound, especially bird song, appeals to children. So does music which is so fitted to the picture that the eye and ear are satisfied simultaneously. On the

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whole, child audiences seem to miss background music if it is deliberately omitted. This may be due to the fact that they are accustomed to music background in films and do not like to have the style changed abruptly.15

The use of music which supports and parallels the visual image may find some application even in straightforward expository films, perhaps in the fields of mathematics and even in the teaching of grammar. In these subjects we have abstractions, words, numbers, and combinations of these, as well as certain definite rhythmic elements—sentence structure for example—to which supporting sound or music might be put. If so, a form of animated cartoon might be developed whose purpose would be to teach at least some phases of arithmetic and English in audio-visual combinations which would synchronize the senses, and give form and movement to abstract symbols, perhaps making for greater retention. Jones, in his discussion of music and the animated cartoon, for example, points out the relation of onomatopoetic sounds and abstract images:

...It is possible to find abstract sounds and abstract images that are sympathetic. Here are two abstract shapes. (See Fig. 10) And here are two abstract words: "tackety" and "goloomb." The words become sounds when spoken, but they have no specific meanings. Yet it is simple to match the abstract words and sounds to the abstract shapes. The angular shape is obviously "tackety," and the curved one "goloomb."

Or, and now we are approaching music, take these two figures: (See Fig. 11)

And take the two sounds: "ooooooooooooooomp" and "poooooooooo--o"

To go clear into music, which of these is the bassoon and which is the harp? (See Fig. 12)

FIGURE 10

FIGURE 11

FIGURE 12

ABSTRACT IMAGES RELATED TO ONOMATOPOETIC SOUNDS
...These are static examples of what are mostly static sounds. The art of animation brings them to life, brings them fluidity and power; endows them, in short, with the qualities of music. The field of graphic symbols is a great but highly unexplored field...

It is thus seen that music and sound might be used to emphasize and support sheer form and movement, to accent, point-up, and serve symbolically in the same way that words do, but in a way not possible to words alone. Eisenstein, in fact, states that since all perceptions of any given piece of music will be individual and unique for each listener, the only logical application of music to film is through a correspondence with the pictorial movement of each shot.

Music and visual imagery are actually not commensurable through narrowly "representational" elements. If one speaks of genuine and profound relations and proportions between music and the picture, it can only be in reference to the relations between fundamental movements of the music and the picture, i.e., compositional and structural elements, since the relations between the "pictures," and the "pictures" produced by the musical images, are usually so individual in perception and so lacking in concreteness that they cannot be fitted into any strictly methodological "regulations."

We can speak only of what is actually "commensurable" i.e., the movement lying at the base of both the structural law of the given piece of music and the structural law of the given pictorial representation.

Here an understanding of the structural laws of the process and rhythm underlying the stabilization and development of both provides the only firm foundation for establishing a unity between the two.

Eisenstein, while pointing out that movement may be expressed thematically and dramatically, says that:

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17 Eisenstein, op. cit., pp. 165-164.
...We cannot deny the fact that the most striking and immediate impression will be gained, of course, from a congruence of the movement of the music with the movement of the visual contour—with the graphic composition of the frame; for this contour or this outline, or this line is the most vivid "emphasizer" of the very idea of that movement.\(^\text{18}\)

Using a fragment from Reel 7 of *Alexander Nevsky*, Eisenstein diagrams the vertical relationship between the audio and visual continuity of this picture, showing "a complete correspondence between the movement of the music and the movement of the eye over the lines of the plastic composition," and demonstrating that "exactly the same motion lies at the base of both the musical and the plastic structures."\(^\text{19}\)

Dewey also suggests congruity of music with line, form, and movement:

Music...gives us the very essence of the dropping down and the exalted rising, the surging and retreating, the acceleration and retardation, the tightening and loosening, the sudden thrust and the gradual insinuation of things. The expression is abstract in that it is freed from attachment to this and that, while at the same time it is intensely direct and concrete. It would be possible, I think, to make out a plausible case for the assertion that, without the arts, the experience of volumes, masses, figures, distances and directions of qualitative change would have remained rudimentary, something dimly apprehended and hardly capable of articulate communication.\(^\text{20}\)

Pointing out that the "intellectual" range of hearing is acquired, having connections with speech and with all parts of the organism,

\(^{18}\)Ibid., p. 175.

\(^{19}\)Ibid., p. 178. Also see Fig. 13, p. 197.

FIGURE 13
A FRAGMENT FROM ALEKSEEV'S PICTORIAL AND MUSIC PLAN
FOR CONJURENS OF MOVEMENT, PICTURES AND MUSIC

PICTURE FRAMES

SHOT I
SHOT II
SHOT III
SHOT IV
SHOT V
SHOT VI

MUSIC PHRASES

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MUSIC

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DIAGRAM OF PICTORIAL COMPOSITION

DIAGRAM OF MOVEMENT
Dewey concludes that hearing is the emotional sense, and states:

The capacity of sounds to preserve and report the values of all the varied experiences of the past, and to follow with accuracy every changing shade of feeling and idea, confers upon their combinations and permutations the power to create a new experience, oftentimes an experience more poignantly felt than that which comes from things themselves.21

Thus, in an empirical analysis, ranging from the practical to the philosophical, music and its role in film is seen to be that of a symbol in a system of symbols designed to communicate ideas. Sound, including words, "effects," and music, appears to be related to visual symbols in an onomatopoetic way, growing out of life experiences, both common and individual, involving combinations of these symbols. As such, they effectively represent reality, extending or amplifying visual symbols, or in themselves acting as the principal symbol in combination with visual symbols to which they impart emotional meaning.

3. Experimental Evidence

Nowhere in studies relating to instructional film production is evidence so lacking and weak as it is with regard to the use of music in films. Only one in the many studies undertaken by the Instructional Film Research Program deals with this rhetorical element, and the findings are inconclusive.

In this unpublished study by Nuckols and Abramson, two versions of the same film were used, one using continuous musical background,

21 Ibid., pp. 240-241.
the other using only head and tail music. The experiment involved students in the third-, fourth-, and fifth-grades, between the ages of 7 to 11. This appears to be a rather naive study since the information of the film, We Make a Fire, was already familiar to most of the pupils, and no differences were found in the informational learning of either film. Also, the validity of the music involved may be questioned.

Fifty-five per cent of the students who saw the film with music accompaniment recognized the presence of this element. Sixty-two per cent of those who saw the alternate version recognized that music was missing throughout the body of the presentation. That is, over half of all the pupils involved in this study were aware of the presence or absence of music in these presentations. However, the summary conclusion drawn in the formal report of the Instructional Film Research Program is negatively stated:

The results of the study by Nuckols and Abramson, though inconclusive, indicate that, in effect, a considerable proportion of the learning audience was unaware of the presence or absence of background music. The question remains unanswered as to whether or not music of which the audience is "unaware" actually facilitates learning.

In view of what is known of the nature of music, its effect on the emotions, and its coincidence with other film elements such as subject matter, line, and form, and its supposed subliminal effect, the complexities of statistical study of this element is obvious. Much

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22 Instructional Film Research, 1918-1950, op. cit., Chapt. 8, p. 29.
23 Loc. cit.
experimentation seems in order to test the individual functions to
which sound and music as aural cues may be put in the process of com-
munication. Some such possibilities are listed by Kendall:

The following relationships suggest useful preliminary
trends of thought to be confirmed by future experimentation.

**Attitude and opinion molders.** Music which is regarded
highly by the audience might be used to set up favorable
attitudes toward the audio-visual material in the film.
The same device could operate in reverse and help form
unfavorable attitudes.

**Memory reinforcing.** The strengthening of new learning
by association of the familiar with the unfamiliar may
be assisted by the use of familiar music as a framework
to aid recall. The repetition of music with a given
visual and its variations might be a desirable memory link.

**Concept-forming aids.** Music might be used as a clue
suggesting association by inference with a new experience
not previously related to familiar ones. In the same
way, the function of music, used as a clue, might aid in
pointing toward a problem's solution.

**Emotional drives for learning.** Music might provide an
emotional tone or excitement to the learning experience.
Correctly conceived informational films are designed to
leave unanswered questions in the mind of the viewer toward
the solution of which he must actively participate. Music
might be used to provide a kind of reward, in that the
viewer would feel pride in recognizing correctly the asso-
ciation intended by the music.

**Music as a "pointer."** Music might be used to direct
attention to a particular occurrence in the visual stream
or in the sound track. It might provide a source of
direction for attention by overcoming previous distrac-
tions. Contrasting tone color might be used to sustain
attention for long periods and prevent day dreaming.

These would constitute only beginning studies in film music.

There are many more complex relationships to be investigated. At the

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*Kendall, Ken. "Film Production Principles - The Subject of
moment, however, about the only thing we know from laboratory experiments with music is that more experimentation is needed.25

Summary

In a survey of twenty-one widely used educational films, twenty were found to include sound effects, and fourteen included music. Six of the nine school-films in the list contain no music. These are films released by Encyclopaedia Britannica for use in the elementary grades, and all are at least five years old. The implication is that natural sound effects are more important than music in films for children. All but two of the films in the list of adult films, however, contain both music and sound effects.

A wide variety of types of music and sound effects is used in these films. The music ranges from the conventional, non-committal "background" type written or "canned" for film by anonymous musicians, to the highly professional work of experienced film composers like Virgil Thomson, Gene Forrell, and Paul Smith.

Sound effects and music are considered jointly here for reasons given in a previous section, and although much of what is said pertains directly to music, the same observations may, in most instances, apply to sound effects as well. Both elements appear to serve several purposes, sometimes changing function within the same film.

25 There are, of course, a number of studies which show a predominance of the visual over the verbal element, and which bear out the well-worn production axiom that visual thinking must prevail in every stage of film production. However, it is also apparent that sound effects and music, if they are to be integral parts of the presentation, must also be considered in this "visualization."
Three general uses of film music may be defined, however, and these, although unsubstantiated by scientific experiment, are borne out by empirical evidence on the psychology and philosophy of music and its relation to visual forms.

(1) Music can underscore, support, and emphasize what the audience has already learned from the visual image. The playing of "Yankee Doodle" in a scene in *Land of Liberty* showing the embattled farmers at Lexington confirms what we already know. Nor does the sound effect as Henry hits his head on a Chinese gong in *Brotherhood of Man*, add to the informational content of the scene, although it may direct our attention, and emphasize the visual fact. The playing of "America" in *America the Beautiful* underscores what we see as Beautiful America on the screen.

(2) Music can shift and add new meaning to an already meaningful visual signal. This "coloristic" use of music is common in entertainment films, less familiar in present educational film production. In *The River*, for example, a few measures played off-key by horns, give a new meaning to a scene of devastated woodlands as the audience recalls hearing his musical phrase played on key in a previous scene showing virgin wilderness. Kaper's use of a banjo as background to a scene showing a soldier writing a letter home is similarly intended to shift the meaning of a serious scene towards the lighter side.

(3) Music can add meaning to an essentially non-committal visual. Music or a sound effect can become a key signal, carrying with it the principal sense of the scene. The close-up of the carved
mask that represents Kelora, the blind medicine man in *The Loon's Necklace* tells us nothing until the sound of the loon's cry is heard. In the Nazi propaganda film, *Victory in the West*, "music changes an English tank into a toy...removes the weariness from the faces of tired soldiers, makes a few tanks symbolize the advance of the whole German army."

The relationship of visuals to sound in films has been much discussed, and there is some evidence of visual primacy. There is also a generally held opinion that the effect of film music is, or should be, below the level of consciousness. It is recognized by film practitioners and scientists alike that inappropriate music can be distracting and destructive to the content of a motion picture.

These factors do not invalidate the need for a careful study of the function of sound and music in the learning process. In each of the three functions listed above, memory plays an important role, since our understanding of any sound signal is dependent upon our past experience with that kind of signal. It is at this point that the intellectual basis of the emotional function of the ear must be considered. It would appear that sounds and music, like words for which they have affinity in human experience, are symbols which must be interpreted, which must have "exchange value" in the process of communication.

The task of the film maker, at any rate, is to choose the right music cues, and to put these together with visual elements in the light of the total presentation. The extent to which such an audio-visual composition might go is suggested by Eisenstein who unites
music with the visuals not only in a "coloristic" way, but more importantly, in his judgment, to express the essential "line" and "form" of the image within the frame.

The possibilities of the complete synchronization of visual and musical "movement," rhythm, and form in the teaching film, especially in the fields of mathematics and English, present challenging possibilities for experimental research. Testing procedures and experimental patterns will be difficult to devise for this purpose if we continue to strive for neatly definable increments in information, for music cannot be translated into words or figures. It would seem that we have need here for a different type of thinking before we can have an improved type of research in this field. It may be as Dewey expresses it:

Thinking directly in terms of colors, tones, images, is a different operation technically from thinking in words. But only superstition will hold that, because the meaning of paintings and symphonies cannot be translated into words, or that of poetry into prose, therefore thought is monopolized by the latter. If all meanings could be adequately expressed by words, the arts of painting and music would not exist. There are values and meanings that can be expressed only by immediately visible and audible qualities, and to ask what they mean in the sense of something that can be put into words is to deny their distinctive existence.26

26 Dewey. *Art as Experience*, op. cit., pp. 73-74.
CHAPTER XI

OPTICAL AND SPECIAL EFFECTS

1. Evidence from the Present Study

The motion picture camera is capable of a variety of pure cinematic effects designed to overcome time and space, to synthesize, expand, contract, and otherwise transcend reality.

The time element can be modified, for example, by exposing a single frame every 24 hours or less, or by shooting 100,000,000 frames per second. Photomacrophotography and photomicrography make it possible for us to see the minute and the invisible. Reality can be symbolized, changed, or exaggerated through such effects as fades, dissolves, wipes, zooms, flip-overs, split-screens, background projection, montage, and the like.

Some of these effects may be produced in a standard camera on the set, others are made in high-speed or animation cameras, and still others are produced in a highly specialized camera-projector combination known as an "optical printer."

The same effect may often be secured by more than one method, and in some cases a combination of several methods may be employed. In any case, the results are uniquely cinematic, and place at the disposal of the producer of educational films important methods by which the powers of human observation may be extended.

Naturally, not all of these techniques are found in the twenty-one films in the Educational Film Library Association list. The fade, dissolve, and wipe, which are collectively known as "optical effects,"
however, were selected for detailed study, together with certain "special effects"—a generic term covering several of the cinematic techniques described above.

A count was made of the number of fades, dissolves, and wipes found in the list of most used films to see how and to what extent such effects were used. Since, in most cases, the scripts did not indicate all the effects used, the results were derived from observation of each film, by a direct count of all effects in the body of the film, excluding those in the titles. The animated films, Boundary Lines and Brotherhood of Man were excluded from the analysis because of their unconventional form, and because animation, although it may be regarded as a "special effect," is discussed in detail in Chapter IX.

In the list of school films, the use of standard optical effects ranges from Common Animals of the Woods, where effects appear only in the main titles (and hence are not counted in the tabulation), to Land of Liberty, Part I, where 10 fades, and 51 dissolves were used in a 750-foot unit—an average of about one effect every 20 seconds or twelve feet. While a greater number of effects might be expected in the theatrically-designed pictures like The Loon's Necklace, Land of Liberty, and The River, it is interesting to note that the relatively simple, one-reel picture, Farm Animals, produced for the elementary level, contains as many fades, nearly as many dissolves, and more wipes than the complex and artistically conceived production, The River.

1 Appendix F, p. 281.
which is nearly three times longer. In general, however, the films with simple themes contain fewer effects.\(^2\)

In the films on the adult list, the number of optical effects ranges from a total of 69 found in *Preface to a Life*, to 4 found in *America the Beautiful*. The adult films, as a group, contain more effects than the school films partially as a result of the more complicated concepts involved, but also, of course, because of their greater length.

In all films in both categories, the uses to which these effects are put are traditionally syntactical; that is, they are used in much the same way as punctuation is used in writing.

The dissolve is used to effect short time lapses and transitions from one idea to another, although in some cases it appears to be used simply to enhance visual smoothness and continuity. It is the most commonly used punctuation in the group of films observed, a total of 113 of these optical effects occurring in the school film list and 197 in the list of adult films.

Fade-ins are used to open the presentation and to bridge sequences separated by time or space. Fade-outs are used to end sequences and to close the film. The fade corresponds to, and perhaps has been derived from "curtain up," and "curtain down" in the theatre.

It should be noted that in pictures like *Adventures of Bunny Rabbit*, and *Gray Squirrel*, where fades are used to indicate passage of weeks or of the seasons, the time element is also reinforced by appro-

\(^2\) Appendix H, p. 286.
riate narration: "Many days go by"; "after autumn comes winter"; "soon the squirrels are three months old," etc. The time concept is one of the most difficult for children to understand, and methods of establishing the time element filmically, especially with younger audiences, seem to warrant special study. A total of 51 fades are found in the school films, and 75 in the adult films. Both the fade-in and the fade-out are included in this count.

The wipe is infrequently used, only 2 of these effects being found in the school films and 4 in the adult films. It is also a device for effecting transitions, but requires more selective use than the dissolve because of factors which will be discussed later.

In addition to optical effects, several of the films studied contain special effects.

The Loon's Necklace includes liberal use of the de-focus, double-printing, and zooms, produced either in the camera or in the optical printer.

In Overdependency a dream sequence is accomplished by double-printing animation in combination with live photography. The technique is described in detail by Spottiswoode in his chapter on "Synthesizing Space and Time." 5

Human Reproduction, although primarily animation, achieves many effects of "movement" through the device of connecting static drawings and models by means of dissolves. In certain instances, double-printed overlays are used for purposes of comparison or emphasis. For

5Spottiswoode, op. cit., pp. 144-146.
example, a transparent ruler is dissolved over a drawing of the human ovary to establish its length as 1\(\frac{1}{2}\) -inches. The numbers one to twenty-eight are double-printed in rotation over an animated drawing of the functioning of the ovaries during the menstrual cycle which lasts for 28 days.

Several films also contain what is generally known as "montage," a term which "has come to mean almost everything from superimposed scenes, double exposure of various kinds, and split-screens, to a series of short shots dissolving one into another..."  

A montage is found in *Learning to Understand Children*, Part I, consisting of a number of very short shots connected for effect with dissolves, as indicated by the script:

**Scene**

**Narration**

6.

DISSOLVE TO:

Montage scene, showing a number of pupils, each engaged in a different school activity. For example, one student is in a chemical laboratory mixing solutions, another is seated at a desk, in deep concentration on what he is writing; a third is painting a picture; a fourth is doing a high dive in a pool, a child is playing with wooden blocks, girl is cooking, another is engaged in dress-making, etc.

It is a collection of individuals no two of them alike. Each pupil is an individual personality, with his individual differences, abilities and needs. Today it is acknowledged that good teaching is based on serving individual needs.

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4Fig. 7, p. 161.

In Land of Liberty, Part I, montage is used to express the printing of worthless Colonial money and the consequent confusion and chaos resulting therefrom. In this multiple-image sequence, we see a prismatic view of the Continental currency revolving around a close-up of a woman pleading with a store-keeper who is refusing her worthless money.

The montage is a special effect, but it is obviously a part of the editing function, too. The film editor's job is to "lay in" these effects, and develop an impression through a synthesis of fragments of visual evidence. Sometimes, as in the cases cited above, these fragments are connected with various optical effects. In other cases, the effect is gained solely through straight cutting, as for example in The River, and in Children's Emotions, where, as in the example below, a series of short shots is used to build an understanding of how babies become frightened and disturbed.

**SCENE**

45. Six months old baby lying in crib. Close shot.

46. MS Mother comes in with visitor who shouts and jabbers at baby.

47. CS bathtub. Water suddenly spurts out noisily.

48. Fire reels whizz by on street.

49. Band passes with drums rolling loudly.

**NARRATION**

What is there to frighten babies?

Well, suppose you were six months old. You've been used to a quiet room.

(Sirens, drums, etc.)
50. Man laughs loudly directly at camera. Why doesn't he just show you pictures?


52. Real train with steam hissing out of valve. Very close.

Creative cutting, therefore, is, in action, a form of "special effect," and in the classic definition of the Russian film makers, creative cutting is "montage." Technical distinctions remain, but the intent of all optical and special effects, including "montage" is to extend, condense, and otherwise modify reality by means of a purely cinematic device.\(^6\)

In the films on the Educational Film Library Association list, then, optical effects are used in all but one film, and special effects are used in several. The latter range in diversity from zooms, overlays, de-focus, and combinations of live and animated photography, to "montage." Films with simple themes, notably those on the school level, tend to contain fewer optical and special effects than films with more complicated idea-structures and those of longer length.

Fades, dissolves, and wipes are used syntactically, the dissolve

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\(^6\) Spottiswoode defines "montage" as "... a type of cutting using numerous dissolves and superimpositions rapidly following one another to produce a generalized visual effect." (p. 440) His definition of "dynamic cutting" is "... a type of cutting which, by juxtaposition of contrasting shots or sequences, generates ideas in the mind of the spectator which were not latent in any of the synthesizing elements of the film." (p. 417) *Film and Its Techniques*, op. cit.
being the most widely used effect. Certain special effects are used impressionistically, as in the case of montages, where an emotional and perhaps subliminal effect is intended. Other special effects are used informationally—for comparing sizes, indicating specific time periods, and to make clear relationships which cannot be readily portrayed by conventional photographic reproduction.

It must be recognized that optical and special effects become mere "trick photography" when inconsiderately used. While there are some instances in which the use of an optical effect might be questioned, in none of the films examined did the use of any of these devices appear to be unwarranted.

2. Empirical Evidence

The origins of optical and special effects go back to the day when Méliès, in his apprenticehood, accidentally double-exposed a roll of film and thus "discovered" the superimposition, and to the time when D. W. Griffith first began to use the diaphragm of his lens to effect the "iris-in," and "iris-out," the forerunner of the fade.

Through the years, film practitioners have come to feel that optical effects add a desirable and necessary professional touch to the production of a motion picture. As one optical effects specialist puts it:

Today it is the rule—not the exception—that every film designed to alert and hold the attention of an audience must be laced together with intelligently planned and professionally rendered special effects or opticals. While the average viewer is rarely conscious
of the actual techniques, he nevertheless feels their presence—or absence—without identifying them.7

Dore Shary, executive vice-president of Metro-Goldwyn-Mayer, expresses the Hollywood point of view:

These "opticals,...are the film's form of punctuation. The cutter is entitled to make an instantaneous cut from one shot to another only when no slightest time lapse is involved, as when a character walks out of the room and into the next, or when Joe dials the factory phone and Mary picks up the receiver at home. If a moderate time lapse is involved, such as that between Joe driving away from his house and driving into the plant, we dissolve...A long lapse of time or a significant stop-and-fresh-start in the story is conventionally signaled by a fade...You might say that a cut is a film comma, or a dissolve is a period or paragraph, and a fade is a chapter break.8

Professionally, the fade is used to introduce and close a picture, corresponding, as has been noted, to the raising and lowering of the curtain in the theatre.

The dissolve, or "mix" as it is called by the British, is a more uniquely cinematic device consisting of a fade-in superimposed on a fade-out, used conventionally to express:

...a transition within the framework of a sequence, or between sequences, when there is to be no pause in the flow of the film...The dissolve has been called—with ample reason—the most significant of all cinematic and televisual discoveries.9

The wipe, although a truly cinematic device, is more controversial than the fade or the dissolve. There are many kinds of wipes, the most common of which are the right-to-left wipe and the left-to-

8Shary, op. cit., pp. 203-204.
9Sobel, loc. cit.
right wipe, in which the second scene appears to push the first off the screen in the direction indicated. Top-to-bottom, and bottom-to-top wipes are also commonly used, and a great variety of other wipe patterns have been developed.

Wipes are generally used to accentuate an on-going action. A right-to-left wipe, for example, is logically used as a transition between shots in which the action is proceeding from screen-right to screen-left. Alternating right-to-left and left-to-right wipes are often introduced for variety and contrast in connecting a series of short, static shots.

Larry Sherwood, vice-president of the Calvin Company, suggests that the wipe might be used as a deliberate attention-directing device:

...It is possible to conceive that effects of the nature under discussion can within themselves be potential educational factors. One illustration: it is a matter of record that by habit the human eye travels to the left when presented with a screened object. Suppose it becomes necessary to direct the attention of the audience to the right side to derive the maximum educational value from the scene. We merely introduce the picture with a vertical right to left wipe. The action in the effect draws the attention of the audience to the right side of the frame, thereby directing the attention of the audience, and obviously minimizing the normal reaction of left to right visualization. 10

While the wipe may possibly serve to direct attention, there are other more satisfactory and perhaps less expensive ways to do this.

Composition, contrast, movement, the use of arrows, pointers, lighting, or any of a dozen ways may be employed to direct attention. The wipe, too, may distract attention. Spottiswoode, in his early, theoretical work, notes that the wipe tends to detract from "the reality" of the presentation:

The cut is in the strictest sense imperceptible, and is only a logical abstraction; the wipe, on the other hand, by hypothesis, occupies a perceptible period of time. In this it resembles the dissolve, but, unlike the dissolve, it draws attention to the surface on which it appears; it makes the screen resemble the upper side of a calendar, a solid object from which pictures may be successively torn, the process of tearing being visible. By thus drawing attention to the reality of the screen, the wipe tends in part to distract the mind from projected images, and in part to "materialize" them; so that not only is the contrast of transference rendered less acute, but the reality of the shots in themselves is impaired.  

The wipe, therefore, appears to require more selective usage than either the fade or the dissolve, and lends itself to considerable discussion on the part of practical film makers. The whole subject of "film punctuation," as it is labeled by Shary, or "photographic embellishments," as optical effects are named by Sherwood, warrants further research.

For example, while these effects are supposed to alert, direct, and hold the attention of the audience, symbolize time-lapses, effect introductions and closings, indicate transitions between ideas, and sustain continuity, they are expected to do this subliminally.

Sobel holds that "while the average viewer is rarely conscious of

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the actual techniques, he nevertheless feels their presence—or absence—without identifying them. Sherwood emphasizes that "any effect that is obvious is not a good effect, because the moment the audience becomes conscious of the transition created by an effect, that effect begins to detract from the intent of the story and from the intent of the effect."

The optical effect, therefore, is considered to be an effective device for achieving certain effects subtly and in a way which will establish a "feeling," or "sense" of what the film maker is trying to communicate, without drawing the attention of the audience to the manner in which this is accomplished.

It is hard to test the subliminal. But the possibility that the same feeling may be imparted without the use of opticals, is, of course, of considerable interest to the producer of the low-budget educational film to whom the cost of such effects is a real consideration. If the film can be educationally as effective without optical effects, then the savings may be put into other more important elements of production.

The writer tested this hypothesis in the production of a film, limited in budget, in which the use of fades and dissolves would not only have been conventionally correct, but necessary. This picture, showing the stages in the development of a frog egg, involved time

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12 Sobel, loc. cit.
13 Sherwood, op. cit., p. 480.
lapses between scenes showing different stages of development of a frog egg. Dissolves were clearly called for. Straight cuts were made instead. The narration, of course, indicated the time periods involved.

This film, defying conventional film syntax, was judged the best instructional film produced by any university in the University Film Producers Association in 1950, by a panel composed of both educational film makers and producers of commercial and promotional films. While this, of course, is not a measure of the educational effectiveness of the film, it does indicate that professional film makers accept the absence of certain film conventions in an educational film of this type.

There is, furthermore, some evidence of fresh thinking in the matter of optical effects by Hollywood. Shary, for example, takes the time-honored fade to task:

Having dutifully set down the conventional film punctuation, I would like to air a personal phobia against the use of fades. I think the fade is an out­dated device, and I prefer to use instead a lengthened dissolve. This is not esoteric hairplitting. The "full stop" of a fade breaks the continuity of image, and in my opinion a sustained continuity of image is a vital key to really full utilization of the film medium. I think the fade is a hangover from the old days when film was borrowing its construction from the stage, when we used to build our film stories in chunks, like acts. But we have come to realize that pictures do not need "intermissions" as the theatre does, and nowadays the best pictures move steadily along an upward line, with unbroken continuity of image and thought from beginning to conclusion.

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14 The Development of a Frog Egg. 1-reel, b&w, sound. Produced by The Department of Photography, The Ohio State University, 1950.
15 Shary, op. cit., p. 204.
Obviously, some method for clearly establishing shifts in time and location must be employed in films where such orientation is called for. Actions, unnecessarily long and involved, need to be abridged or condensed. Optical effects will continue to be used in such cases until other methods are devised.

At the same time, the possibilities of the straight cut need to be kept in mind, together with the fact that the indiscriminate use of opticals, particularly the wipe, may tend to distract rather than add to the values of the presentation.

The same danger is inherent in the use of special effects.

Hoban warns:

Any use of pictures or "special effects" not readily plausible or understandable must be explained. An audience not able to comprehend how a picture could have been taken of the subject will reject the entire sequence unless the devices are explained in the picture. Any use of photographic techniques, including slow-motion or fast-motion photography, particularly with younger audiences requires careful explanation in order to achieve its full effectiveness.16

Certainly, the stop-motion portrayal of a plant coming into being, or the slowly-patterned splashing of a drop of milk caught by the high-speed camera must be accompanied by appropriate explanation and time orientation for educational purposes. The effect of overlays, montages, and other special effects must be evaluated in terms of how they contribute to the communication of the idea. They must be more than mere tricks of the optical printer. The central purpose of such effects in an educational film must be to contribute

information. But they may also serve to contribute to the "sense," or "feeling" involved in the situation on the screen.

In this latter sense, montage, and other special effects may be used, like music and opticals, for subliminal effect. In spite of the fact that many of these effects were expertly worked out at the turn of the century by men like Méliès in Paris, and Paul, in England, we still know very little about how the visual shorthand, collectively known as special effects, acts upon an audience.17

We have learned how to use the camera as a tool in the production of photomicrographic, high-speed, stop-motion, and similar scientific motion picture studies, and we know a little about the effects of "montage" in the sense of creative editing from the Russian film makers who, as Seldes points out:

...were dealing with extremely simple people; to many of them a moving picture was a great novelty. Vast numbers had never learned to read and all of them were living in a period of extreme confusion. All of these factors made it possible for film makers to develop a method which did not so much tell a story as create a series of impressions which built up and built up until the impressions alone could be trusted to put over the idea for which the film was made. They called the method "montage," and what struck the observer particularly was the speed with which one image cut in on another and the precision with which the directors chose their images for their effects. The obviousness of the material used might offend the pedantic. You see a boy in jail; you see his mother trying to slip him a note, you see the guard who prevents her. The guard looks away and you see what he sees; an insect trying to get out of a bowl of food. You see the mother again; you see the son again and then you see the guard flicking the insect back just as it is about to go free. You have a premonition about the escape of the prisoner which has been conveyed to you without anything definite, conveyed indirectly and symbolically--

and therefore very effectively...

The Russians made some errors at the beginning by overplaying the montage system, by having too many scenes in which the images come too rapidly, and they neglected the long-run cutting in favor of the short. But there is no question that they had reverted to the basically correct principles of cutting for emotional effect which Griffith had developed and dozens of later directors had neglected.18

With primitive or unsophisticated audiences and with children, it has been shown that utmost simplicity and clarity are of primary importance in the composition and arrangement of visual cues. The Russians, says Seldes, made pictures for simple audiences, but mistakenly used "too many scenes in which the images come too rapidly." Twenty per cent of the students reporting in an early study by the Committee on Motion Pictures in Education of the American Council on Education, indicated short scenes as a weakness of teaching films.19

Montage, as a series of short shots cut together or connected by optical effects, should be considered in the light of the audience for whom the effect is supposed to carry symbolic meaning. In the case of young people, the clarity of the message might be improved when such effects are completely eliminated.

On the other hand, when skillfully done, montage and special effects make the motion picture a truly unique medium of communication:

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19 Holan. Focus on Learning, op. cit., p. 144.
The most fascinating aspect of the montage is the ability to burst the bonds of time and space and even reason, and still to remain entirely credible. When we see the picture of a bullet superimposed over a shot of a turning globe which may even be combined with that of a ship at sea with the waves breaking over its bow, we do not pause to question this violation of time and space. The appeal of the montage is wholly emotional.20

The "fascinating" aspects of montage and special effects have been incorporated in the work of Maya Deren, and other avant-garde film workers. On the professional level, Cocteau's Blood of a Poet, Beauty and the Beast, Orpheus, and other films typify the use of special effects for expression of fantasy. The American Topper series was also based on special effects. These effects, as Sobel describes the montage, can be "wholly emotional."

It seems equally clear, however, that such effects can also become a means of enlarging understandings, and communicating the "sense" of things in a purely associative and cinematic way. If the symbolism is skillfully executed, and within the range of understanding of the intended audience, the special effect may capably serve the educational objective. Like animation, the special effect may be a "bad master, but a good servant."

3. Experimental Evidence

As previously mentioned, well conceived and skillfully used optical and special effects are generally considered to be subliminal in effect. In many cases they are intended to convey a "feeling," or to

have a purely emotional appeal, rather than to convey specific information.

This makes it difficult to devise a testing pattern to measure the effect of opticals, with the result that there is very little experimental evidence on this point. The report of the investigations of the Pennsylvania State College Instructional Film Research Program regarding optical effects is still in preparation. The general findings, however, are summarized by Carpenter and Greenhill as follows:

An experiment was recently completed on the effect of opticals on learning from instructional films. Three versions of each of two different informational films were prepared. One version of each film had no opticals (straight cuts all the way through); a second version had fades only between major divisions of the film; and the third version, which was the film as originally produced, had a liberal number of fades, wipes and dissolves used in accordance with the generally accepted "rules" for using these effects. The learning results showed no significant differences between the versions.

It would seem that more evidence is needed in the matter of opticals. Since film practitioners regard optical effects as "syntax," it is doubtful if the results of their use can be measured in terms of information, any more than the effect of the use of conventional punctuation in written material can be measured in terms of its contribution to the informational content of the writing.

The fact that the use of such effects often gives a "professional look" and pleasing visual flow to a picture which might otherwise appear choppy, might be justification for their use, even though such

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effects might not add to the informational content at all.

On the other hand, there may be some types of films in which effects are superfluous, as indicated by the existing research. If this is so, producers of educational films may be able to effect savings in the order of $100.00 to $150.00 per reel by the elimination of such unnecessary optical effects.

Experimental evidence on the effectiveness of special effects is limited to a single investigation. Neu, studying certain special effects as "attention-gaining" devices, used five versions of an introductory film on machine shop measuring instruments.23

The first version used no special attention-gaining devices; the second added "relevant" visual attention-gaining devices; the third employed "irrelevant" devices; and the fourth and fifth versions were designed to test the effect of relevant and irrelevant sound devices for gaining attention, respectively.

The test populations consisted of 1576 Army trainees and 1055 Navy trainees. The basic version, devoid of special attention-gaining devices such as extreme closeups, spotlighting, stop motion, pointing finger, zooms, and unusual camera angles yielded the highest score, significant at the one per cent level, with the Army trainees. With the Navy trainees, the basic version was also superior to the version with irrelevant devices, and almost as effective as the version in which relevant attention-gaining devices were used.

Since only the "attention-gaining" influence of these effects were studied, the results can be applied only in a limited way with

23 Neu, loc. cit.
regard to the many possible uses of special effects. Neu's conclusions, nevertheless, merit the serious consideration of educational film producers:

1. Where instruction is the principal aim, and cost a consideration, producers of training films should present the subject matter in a simple, straightforward way and avoid the use of such fancy and expensive devices as spotlighting, zooms, extreme magnification, and stop motion, to gain the learner's attention.

2. If it seems necessary, in an instructional film, to use devices to attract or direct the learner's attention, use a technique which will emphasize something already in the film—some special treatment of indigenous materials related to the subject content—rather than introduce extraneous or irrelevant materials.24

The experimental evidence on the use of optical and special effects is suggestive rather than conclusive. It has been found that some forms of special effects, whether used relevantly or irrelevantly in terms of subject matter, appear to yield negative results when used as attention-gaining devices.

The use of optical effects specifically to establish time and place transitions, however, appears to warrant further investigation, and the subliminal effects of both optical and special effects should be considered. The whole field of special effects—montage, time-lapse, high-speed, split-screen, and visual configurations possible in the optical printer—in relation to how purely cinematic symbols can be applied to learning, is especially interesting and challenging. When such effects are used in scientific or technical films, the

24Ibid., p. 35.
problem becomes one of orientation, the use of time-space comparisons
with reality, and of simplicity of symbolism in terms of the intended
audience. When they are used for impressionistic purposes in an
emotional context, the problem becomes related to the subliminal
effect of these devices, to which no measuring instrument has yet
been applied.

Summary

Optical and special effects are purely cinematic devices which
afford the film maker a means of expression possible in no other
medium. The possibilities of time-lapse exposures, superimpositions,
fades, and the like, were recognized and practiced even in the early
days of film making.

The development of high speed cameras, and the optical printer
increased the range of cinematic possibilities for synthesizing,
condensing, extending, and enlarging upon reality in many ways for
many purposes.

Fades, dissolves, and wipes, have become known as the syntax of
the film, and today are widely used by professional film makers.
In twenty-one widely used educational films these effects are used
conventionally in all but one, in which effects are used in the titles
only. The dissolve is the most widely used effect in these pictures.
Sobel calls it "the most significant of all cinematic and televisual
discoveries."

Professionally, the optical effect is in part designed to enhance
the visual flow, to provide the "curtain up," and "curtain down" ef-
fect, and to serve as transition devices. The dissolve, for example, like the paragraph of a printed page, does not add informational content, although it may be intended as a psychological "breather," or a pause for the introduction of a new idea.

The producer of the educational film must consider the use to which opticals are put from another point of view. These effects, if achieved in the camera, are limited to the fade and the dissolve, and are often lost in editing. Produced in an optical printer or by the travelling matte ("A" and "B" rolls) method, an expense is involved which may be as high as £150.00 per reel. Successful pictures have been made without optical effects, and the savings put into more important phases of production.

Producers of educational films should consider that young children and unsophisticated adult audiences of "film illiterates," may fail to understand the intent of the average optical effect, since such understanding comes with increasing familiarity with motion picture form. It has also been noted that straight outs generally advance the story whose action is direct and simple, whereas, as Shary points out, the use of fades may tend to retard or interrupt the visual flow. Similarly, the wipe, by drawing attention to itself, may also detract from the subject matter of the film. Experimentally, optical effects have been found ineffective in terms of improving learning from certain types of training films.

While the evidence tends to discourage extensive use of optical effects, not much is known about the possible subliminal effects of these devices, a fact which merits further consideration.
For the present, professionally executed and considerately used optical effects may be justified for adult-designed films on the practical basis that they enhance visual flow, and that they constitute the established and conventionally accepted syntax of film by which smooth transitions involving changes in time, place, and idea may be effected.

Like the optical effect, the special effect, if used indiscriminately, may distract attention from the content of the film itself, and serve only to eulogize the technical virtuosity of the optical printer, or the animation camera.

On the other hand, the intelligent and creative use of special photographic effects to clarify, extend, and deepen our knowledge and understanding of life, both scientifically and sociologically, is richly illustrated in the group of films under discussion.

The responsibility of the film maker in respect to both optical and special effects appears to involve caution in their unconditional acceptance as cinematic conventions, and an imaginative approach to their possible use as significant cues in the film communiqué.
CHAPTER XII
DESIGN IN THE EDUCATIONAL FILM

1. Summary

The purpose of this investigation has been to find and test the meaning of what is proven, practiced, and surmised about certain elements in the design of effective educational motion pictures, and to lay a firmer foundation for present production and for future research.

The writer did not expect to develop a "formula" for the making of the successful educational film. The film experience is dynamic, not static in quality. The rhetorical elements in any film interact with each other, with the nature of the audience, and with the time and circumstances of showing. This makes it difficult to isolate any single factor for study and then to combine it with other production elements in a "master design."

However, since a growing body of subjective and objective evidence on educational film production does exist, it seemed reasonable to check this evidence against production techniques found in a group of films which have found wide acceptance and use by teachers and leaders of school and adult groups. Such analysis, it was believed, might lead to a better understanding of the whole process of film communication, to new insights on what makes an educational film popular, and to a synthesis useful for future production and suggestive of further research.
The springboard for the study was provided early in 1953 with the publication of the Educational Film Library Association's "Report On Most Used Films."¹ This was a survey of the Membership of the Association to discover the titles of the ten or fifteen films most used by school and adult groups. From a total of 154 returns, in which the titles of 952 films were mentioned, nine films were found to be most popular with school groups, and thirteen were listed as most used by adult groups.

Films reported as most used in the school field were: Adventures of Bunny Rabbit; Colonial Children; Gray Squirrel; The Loon's Necklace; Autumn on the Farm; Land of Liberty; The River; Common Animals of the Woods; Farm Animals.

Films reported as most used by adult groups were: Preface to a Life; The River; Children's Emotions; Overdependency; America the Beautiful; Angry Boy; Human Reproduction; Learning to Understand Children; Feeling of Hostility; Broader Concept of Method; Brotherhood of Man; Boundary Lines; Animals Unlimited.

One film, The River, appeared in both lists, so that while for comparative purposes a total of twenty-two films was considered, generalizations on the entire list of films, regardless of the level for which they were intended, were made on the basis of the twenty-one individual titles.

The selection of specific elements for study in these films was guided by the following criteria: (a) the elements had to be those

which could be identified and defined with reasonable accuracy, (b) they had to be elements on which some experimental evidence existed against which the present findings could be checked, (c) they had to be elements of practical concern to the producer of educational films.

On this basis, the twenty-one most used films listed by the Educational Film Library Association were analyzed with respect to:

(1) structural organization, (2) audience involvement, (3) level of verbalization and rate of delivery, (4) camera interpretation, (5) color, (6) music and sound effects, (7) optical and special effects, and (8) animation.

Scripts and teacher's guides were obtained for sixteen of the twenty-one films, so that in these cases the analysis proceeded from script as well as from screen. Each film was viewed at least three times, and various sub-studies were involved in the determination of each of the factors mentioned above.

In general, these productions reflect a variety of approaches to educational film making. Encyclopaedia Britannica Films produced or now distributes seven of the nine school films listed. McGraw-Hill Text Films produced or distributes six of the thirteen adult films studied. However, documentary film makers like Pare Lorents and Willard Van Dyke, major studios like Warner Brothers and M.G.M., and seven different independent commercial film production organizations are also represented in the list of twenty-one widely used films under study.

The production dates of these films reveal that seven of the nine films most requested by schools are at least 10 years old, and that
three of the films in this group are 17 years old. Of the thirteen films listed as most used by adult groups, only one is 10 years old, the rest being less than 8 years old.

The fact that approximately three-fourths of all films listed are more than 5 years old, one-third having been produced more than 10 years ago, may reflect the teacher's habit of ordering the same film, and relying on the "tried and true." It may also be evidence of the fact that educational films are slow to get into circulation.

On the other hand, it may mean that these films are "successful"; that they have been found genuinely worthwhile by teachers who have used them over a period of years. Support for this conclusion is found in the fact that "when a film is mentioned as among the most popular in ten or more film libraries it has a real claim to the title of 'best seller.'"\(^2\)

Finally, the quality of these films is attested by awards granted to four of them in international film festival competition, and by the critical acclaim received by many others.

These films appear to meet broad subject-matter needs. There are no "skills" films in the list. They are broadly educational, rather than narrowly instructional. The school films are mostly in the primary area, six of the nine films listed dealing with animals in a simple, straightforward, narrative style. The adult films, on the other hand, reflect the trend toward the dramatically-styled presentation, ten of the thirteen films listed being based on personal or

\(^2\)KFLA Bulletin. op. cit., p. 3.
social problems. The subject matter in seven of the thirteen films is at least partially in the field of mental health, a topic of current concern in a tense and hurried society.

The results of a detailed analysis of production elements in these films may be summarized as follows:

1) **Structural Organization.** The school films tend to be shorter than the adult films, the former having an average running time of 15 minutes, the latter an average running time of 22 minutes. The shorter length of the school films, it may be inferred, is related to the shorter attention span of younger people, and to the simplicity of the themes involved.

   The school films average 92 scenes per reel, with an average scene length of 4.1 feet, or about seven seconds. The adult films average 76 scenes per reel, with an average scene length of 6.0 feet, or ten seconds. The school films thus appear to have a richer visual content than the adult films. The extensive use of dialogue sequences tends to increase the scene length in pictures in the adult group.

   Although introductions, summaries, and repetition have been found to be important organizational factors helpful in promoting memorability, only four of the twenty-one films studied include an introduction, only two contain a summary, and in only six are various forms of repetition—verbal, pictorial, or musical—used to any extent. It must be remembered, however, that most of these films are not designed to impart specific factual knowledge, but to orient, arouse interest, and to develop understandings. They are broadly educational, rather
than narrowly instructional. Much of their wide popularity must be ascribed to this fact.

(2) **Level of Verbalization and Rate of Delivery.** As measured by the Dale-Chall Formula for predicting readability, the narration of the school films ranges from grades four to ten, with an average at between the fifth- and sixth-grades. If *The River,* and *Land of Liberty,* both of which were originally intended for theatrical release, are excluded, the "readability" level of the narration in films most used by schools is found to be at grade four.

The level of narration in the adult films ranges from the fourth- to the tenth-grade, with an average of between the seventh- and eighth-grades. The average sentence length in the school films is approximately 7.8 words; that of the adult films about 21.0 words.

As measured by a reliable readability formula, therefore, the narrations of these films fall at or near the theoretical reading level of the audiences for which they were intended.

The rate of verbal delivery in terms of number of words spoken by the narrator, ranges from 90 to 155 words per minute in the school films, and from 75 to 155 words per minute in the adult films. The total average for all films falls below the 150 words per minute commonly considered to be the "normal" rate of speech.

(3) **Audience Involvement.** Identification, familiarity, anticipation, dramatic structure, and participation have been found to be factors contributing to audience involvement.

Identification is not a dominant factor in the school films, however. In only two of the nine pictures in this group are children
used as protagonists, although six films in the list are definitely intended for the elementary level. In eight of the thirteen films on the adult list, however, we find persons with whom the members of the average adult audience may identify.

With respect to familiarity, eight of the nine school films include characters, places, or situations probably known to most children. Six of the thirteen adult films involve family situations, personalities, or human relations problems familiar perhaps to the majority of adult Americans.

Four of the nine school films include questions or statements which pose problems or create a condition of "set," or anticipation. In the group of adult films, six of the thirteen pictures listed contain similar questions or statements. The introduction, of course, may also be designed to create a condition of anticipation.

All twenty-one films tell a "story." Only three of the nine school films, however, involve elements of suspense and conflict essential to dramatic structure. Ten of the thirteen adult films, on the other hand, involve personal or social conflicts intended to stimulate audience involvement, and which may be described as "dramatic."

None of the films in the total list is designed to require overt audience participation during the film showing itself. Introductory or follow-up activities are left to the teacher or the adult leader. Teacher's guides, suggesting such activities, are available for all of the school films. One of these films, and four of the adult films, however, have endings which may be described as
"open," and which, at least, suggest the possibility of further activity on the basis of information gained from the film itself.

On the whole, the adult films contain more elements designed to promote audience involvement than the films intended for school use. This finding follows logically from the fact that at least eight of the thirteen adult films deal directly with emotional situations, and are intended to influence attitudes.

(4) **Camera Interpretation.** Straightforward, simple camera interpretation on the long shot, medium shot, close-up pattern characterizes the school films designed for the elementary level. In the adult films, the camera is used more interpretively, angle, composition, and lighting being important cues to the meaning of the scene. The technical quality of the photography in all films is good to excellent, and a variety of individual photographic styles is found in these films.

In both groups of films, the medium shot is most commonly used, although three films in the school group, and four in the adult group are composed of a preponderance of close-ups. Some use of the subjective camera is found in *Children's Emotions* and *Overdependency*, in which the camera itself assumes the role of the protagonist, a technique which has been found to encourage audience identification.

(5) **Color.** Only six of the twenty-one films studied are in color, two of these being on the school list, four on the adult list. In these films, color is used both representationally, to show "what it looks like," and symbolically, to show "what it means."
The quality of the color reproduction, with one exception is good, and in no case does the use of color in these six films seem to be unjustified in the light of their intended purpose.

(6) Animation. Six of the twenty-one films include animation ranging in style from comic cartoon and combinations of live photography and cell animation, to masks "animated" by their wearers in *The Loon’s Necklace*.

A number of well-known animation artists and technicians are represented in the list of most widely used educational films, including Philip Stapp, Norman McLaren, and Nathan Sobel. Their work in these films is indicative of the variety of uses to which the technique of animation may be put, and attests the value of the professional film practitioner in the production of educational films.

(7) Sound Effects and Music. Sound effects are used in all films except *Gray Squirrel*. In the school films, with the exception of *The Loon’s Necklace* and *The River*, natural sounds are used only in association with direct visible sources. In the two films just mentioned, and in many of the adult films, sound is also used symbolically, in some cases becoming part of the orchestral score.

Music is used symbolically as well as representationally in ten of the thirteen adult films, in some places serving as key cues to the meaning of the scene, in other places becoming a subordinate background to the picture symbols.

The work of several experienced composers of film music is found in this group of films, including that of Virgil Thomson, Gene Forrell, Robert Fleming, and Karol Rathaus. In at least four cases, therefore,
specially composed or arranged music plays a part in the production design.

(8) **Optical and Special Effects.** Optical effects are found in all films except *Common Animals of the Woods*. The most frequently used optical effect is the dissolve, a total of 113 of these effects appearing in the school films, and 197 in the adult films. The fade (in and out) is the next most common effect, 51 of these opticals appearing in the school films, and 75 in the adult films. The wipe is infrequently used, appearing only twice in the school films, and only four times in the adult films.

Optical effects are used syntactically, that is, they are conventions serving the same purpose served by punctuation in literary works. The fade-in is the beginning of a chapter; the dissolve is a paragraph; the fade-out is a period. The wipe is a specialized form of the dissolve. While such effects are intended to indicate changes in time, place, location, or idea, little is actually known about how optical effects influence the way an audience sees and interprets a film.

Two of the school films, and five of the adult films contain "zooms," double-exposures, montages, or other special effects. The two school films in which these effects are found, are *The Loon's Necklace*, and *Land of Liberty*. Films designed for the elementary are notably devoid of special cinematic devices, and where they are found in the adult films they are, in most cases, used with restraint.

In each of the points noted above, it is seen that the pattern of the films intended for elementary school use is, in almost every
respect, more simple than the design of the adult films. School films are shorter, have less complicated themes, a more simple vocabulary, shorter sentences, and a more basic photographic treatment. They contain less music, fewer optical and special effects, and fewer elements contributing directly to audience involvement.

It is notable that The River appears on both the list of films reported most used by schools, and on the list most requested by adult groups.

The popularity of this film may be explained in terms of the wide publicity it has received over the years, by its availability, and by the probability that teachers have come to associate it with certain recurring curriculum requirements on conservation, geography, the social sciences, or other subjects. The fact cannot be overlooked, however, that this film portrays a basic conflict with which the average viewer, as a citizen of the United States, may identify, that its subject matter is as visually powerful as the Mississippi at flood stage, and that its treatment is uniquely cinematic and effectively symbolic.

Analysis of film design and film preference is a type of consumer research which might well be continued on the basis of yearly tabulations of most used films. We need to know what kinds of films are popular. More importantly, we need to know what makes them popular. We need the same kind of content analyses of educational films which have been, in the past, applied to the entertainment film. We need deep studies of rhetorical elements found in widely used films to see how and to what extent they influence the effectiveness of the film communique.
Such analyses must be tempered by continued reference to the constantly accumulating empirical and experimental evidence on educational film production. Unless evaluated in the light of the professional judgments of film makers, the practical experience of teachers, and the tested findings of the research worker, the results of any analysis of rhetorical elements in existing films are likely to have but limited significance.

In the present study, a close agreement has been found between the design of twenty-one widely used films, and certain empirical and experimental evidence on film rhetoric. Recent experimental evidence often, although not always, supports what has long been known and practiced by experienced producers of educational films. While, at the moment, there appears to be no single, universal design for the successful educational film, we do know something of the elements in the design, and how they operate in the process of film communication.

It is not surprising, however, to find that not all of the films analyzed exhibit all of the possible and theoretically desirable elements which might be used in the film designed for educational purposes. Film-making is a creative business. As in all creative works, selectivity is involved—the judicious use of various film techniques and rhetorical elements in view of the intended purpose and the intended audience, rather than a mechanical application of a formula. Without such selectivity, it has been shown, the elements of a given film may conflict, producing inhibitory or negative effects which destroy its usefulness as a communique.

It should be remembered that while the films involved in the
present study are widely used, they are not necessarily the "best" teaching films that can be produced. The implications for production and research which follow, therefore, are not drawn on the basis of the study of these films alone, but from a synthesis arrived at through a consideration of all the evidence presented in this investigation.

2. Implications for Production

Conditions of distribution being equal, films which are likely to be most popular and most widely used over a period of ten to fifteen years, are those which meet common interests and needs, and which are broadly educational rather than narrowly instructional.

The present popularity of certain films, however, cannot be taken as the sole criterion for future production. As with books and other materials, there is a great need for films on a wide variety of topics, presented in a diversity of styles, ranging from the very expensive production of theatrical impact designed for large audiences, to the low-budget, simply-constructed film designed for the small, specific audience.

We must also learn to build good teaching techniques into films so they communicate directly and effectively with or without further explanation before or after showing. Good utilization by a capable teacher, of course, improves the chances of learning from a motion picture. The big problem in modern education, however, is a rapidly growing student population which must be taught more in less time, in the face of a long-standing shortage of good public school teachers.
and trained leaders in adult education. Since World War II, the importance of techniques for rapid mass learning at all levels has become increasingly clear. There is a marked need for superior films for use in the overflowing classroom and with mass television audiences, where such films will often be used without benefit of introduction and follow-up.

In the past, it has been possible, where necessary, to develop fundamental appreciations and understandings through books alone. In the future, the same may be true of films, television, and other thoughtfully designed media of communication.

With respect to the well-designed educational film, we may say that:

(1) Its effect will be proportional to the degree to which it takes into account the needs, interests, and backgrounds of the audience for which it is intended.

(2) It will be simple enough to be understood by the target audience, and will not contain too many ideas, nor move too fast.

(3) The proposed narration will be written with the vocabulary level of the intended audience clearly in mind, but it will be recognized that what is said is seldom as important as what is shown on the screen.

(4) The rate at which the commentary is delivered will be between 100 and 150 words per minute.

(5) The film may include an introduction which clearly and succinctly poses the problem, orients the audience, and establishes "set,"
or a condition of readiness for the presentation.

(6) Key ideas may be repeated two to four times in a film for added emphasis and reinforcement, but the repetitions will be varied and aesthetically satisfying as well.

(7) The running times of classroom films may vary from five to thirty minutes to fit the class period; but within this limitation, the major consideration in film length will not be the capacity of a 16mm reel, but the nature of what is said, and the best manner of saying it in film form.

(8) It will be recognized that the motion picture experience is an active, not a passive one, and that audience involvement is a matter of degree. The elements of identification, familiarity, anticipation, participation, and dramatic structure will be built into the film to the degree necessary for adequate audience involvement.

(9) Color, music, sound, animation, optical effects, and special effects will be used to simplify, amplify, and reinforce the main idea. The possible subliminal influence of these elements will also be recognized and further explored.

(10) The educational film will be deliberately designed to change behavior, to bring about that participation and sharing in common which characterizes successful communication and effective learning.

While the pure entertainment film is typically conservative, the truly educational film will be provocative and challenging. Learning involves more than an accumulation of facts. Good films can present broad problems of importance, pull our fragmentary world together, and do this in ways which involve the response of the whole learner,
without isolating the intellect and the emotions.

Through the presentation of "forked-road" situations, and by the use of "open endings," such films can become not only a showcase of ideas, but also the theater of our conscience, and a means by which to promote new and better ways of thinking and behaving.

The need for a wide variety of self-sufficient films deliberately designed to influence behavior, places a heavy responsibility upon the producer of educational films. He must be a creative and technically competent film maker, but he must also be willing to assume his responsibilities as teacher and as communicator of ideas. Finally, he must be able to relate the business of motion picture making to social and technical processes in other fields, and to apply what he learns to the production of better films.

The design of the educational film will change with the changing curriculum, with the development of new motion picture techniques, with the wider range of subject matter dealt with by an increasing number and types of film producers, and with the inevitably changing needs and interests of the society in which films are produced and shown.

Present research in perception, group dynamics, social psychology, and related fields may influence the teaching film of the future. New methods in animation are being developed, the production of films through television systems is being explored, and it is now possible to record images, sound, and color on magnetic tape. Psychologically, sociologically, and technologically, our knowledge of the processes and techniques of communication is being rapidly expanded. As a re-
suit, the educational film fifty years hence, whether electronic, three-dimensional, or wide screen, will be vastly different from the educational film as we know it today.

3. Implications for Research

Research in educational film production techniques is in its infancy. Much of what has been done is weakened by attempts to apply scientific methods and statistical procedures to processes which, as yet, are hardly scientific. This has resulted in the accumulation of much datum which is contradictory and inconclusive.

In many studies involving multiple versions of the same film, factors are artificially isolated which, in fact, cannot be isolated in the unified, integrated production. Often, the validity of the experimental versions themselves is questionable. The results are frequently little more than comparisons of two film treatments of a subject that might have been handled in a dozen different, and perhaps better ways.

Too often the results of such experiments are measured in terms of factual learning alone. While such research is certainly needed, experience has shown that a significant potential of the film is in the area of attitude formation, the development of appreciations, broad understandings, and aesthetic experience. There is a need for the kind of research design in which thinking, appreciations, skills, and information are related in the testing of films which are similarly designed.
In these terms, we have no research which adequately measures the effect of the expository vs. the dramatic portrayal of the same subject, and little evidence on the relative effectiveness of live photography vs. animation, where the job to be done is possible to either. This type of research is extremely difficult. Moreover, if it is desirable to have a greater variety of treatments of the same subject, each of these techniques may be equally valuable, uniquely useful with different audiences.

There is much to be learned about the so-called "subliminal" effects of music. We need to explore the use of music as an aid to recall, as reinforcement for the line, form, and movement of the picture elements in film. New methods of testing will have to be devised here.

New methods of testing the function of optical and special effects will likewise have to be developed. The optical effect, like music, is supposed to exert a subliminal influence, and hence the effect is hard to measure. Since the fade and the dissolve are commonly used to establish time and space concepts, this function might be tested using young children whose concepts of time and space are in process of development. Such study might also tell us something about how we learn the "language" of film.

More research also seems called for on the color factor. Theoretically, all films might be in color because color is a part of nearly every experience. However, there are certain as yet unmeasured distractive influences involved in the use of color which suggest research in the selective use of this element. The same, of course, is true of
sound effects.

The making of an educational film, like the process of teaching, the process of human motivation, and the process of communication, is more an art than a science, at our present stage of knowledge of these matters. The elements of film design interact with each other, and with the perceptive characteristics of the audience, making the film experience a dynamic one, and in the final analysis, one which lies in the field of personal adventure.

The study of film design, then, is not simply a matter of defining and analyzing individual cinematic techniques. It is a matter of studying techniques in interaction with specific audiences and with relation to specific objectives. Dewey touches this point in a discussion of the creative arts:

It is significant that the word "design" has a double meaning. It signifies purpose and it signifies arrangement, mode of composition. The design of a house is the plan upon which it is constructed to serve the purposes of those who live in it. The design of a painting or novel is the arrangement of its elements by means of which it becomes an expressive unity in direct perception. In both cases, there is an ordered relation of many constituent elements. The characteristic of artistic design is the intimacy of the relations that hold the parts together. In a house we have rooms and their arrangement with respect to one another. In the work of art, the relations cannot be told apart from what they relate except in later reflection. A work of art is poor in the degree in which they exist in separation, as in a novel wherein plot—the design—is felt to be superimposed upon incidents and characters instead of being their dynamic relations to one another. 5

Perhaps the great frontier for research in educational film production is not in experimental versions of the same film where factors are artificially isolated for purposes of comparison. Perhaps the great field for research is in the deeper, more basic study of "signs" and "symbols" of which the motion picture is composed, and in their relationship to each other.

For example, we would not study the effect of "music vs. no music" in a teaching film, but rather, the meaning of a specific form of music as a principal symbol, having a specific function at a given point or points in the film structure. It would mean that pictures, words, and sounds, would be studied with respect to their function as key signs or symbols with reference to the probable perceptive behavior of the intended audience.

Such research would have as its objective the development of a more simplified, and perhaps more economical design for educational films, and one which would tend to increase the linearity or directness with which the communique passes from communicator to communicatee. It would be a study of the motion picture for what it really is--a symbol system, not a method of reproducing reality.

In spite of the currently advertised trend towards greater "realism" through three-dimensional or wide-screen films and stereophonic sound, any experienced film maker knows that a completely realistic film record of an event is not only dull, but technically impossible. The choice of lenses, the selection of camera angle, the chemical and physical transformations which take place in the production and exhibition of a photographic record, constitute a screen
or grid which effectively changes the appearance of things as they "really are."

On the other hand, through a calculated reorganization of experience and a skillful rearrangement of reality, a photograph or motion picture can be more "real" than real, can throw new light on the commonplace, and capture the essential meaning of a situation or event.

The suggestive power of the cartoon and other animated forms, for example, involves the use of non-realistic audio-visual symbols which have been simplified, exaggerated, and otherwise deliberately controlled to enlarge upon reality. Similarly, the effectiveness of the close-up is due to the high degree of selectivity involved, and to the sheer abstraction of the subject represented.

With relation to the picture symbol, Langer says:

What property must a picture have in order to represent its object? Must it really share the visual appearance of the object? Certainly not to any high degree. It may, for instance, be black on white, or red on grey, or any color on any other color; it may be shiny whereas the object is dull; it may be much larger or smaller than the object; it is certainly flat, and although the tricks of perspective sometimes give a perfect illusion of three-dimensionality, a picture without perspective--e.g. an architect's "elevation drawing"--is still unmistakably a picture, representing an object.

The reason for this latitude is that the picture is essentially a symbol, not a duplicate, of what it represents...

The only characteristic that a picture must have in order to be a picture of a certain thing is an arrangement of elements analogous to the arrangement of salient visual elements in the object. A representation of a
rabbit must have long ears; a man must feature arms or legs.4

Early film makers also recognized what the philosopher has noted above. In 1937, Vladimir Nilsen wrote:

What is the basic difference between a photographic picture and a spectator's direct impression?

The difference consists first and foremost in the fact that, owing to the associative links of his thought, the spectator's direct perception modifies and adds to the perceived phenomenon from the store of his cognitive experience, transforming it into a pictorial representation, whereas photographic objectivity only transmits, relatively truly, the scheme of formal and linear elements of the object. However, the limited realism of the picture in the film is entirely sufficient to evoke in the spectator an aggregate of associations corresponding to the object filmed. It is to this ability of the picture to cause the required reaction in the spectator, and not to the "lifelike" copying of nature or the situation in the given scene, that we must look for the cinema's genuine possibilities of expression.5

This idea, or observation, has been substantially rediscovered as an outcome of recent film research:

The problem of communication via motion pictures and "still" pictures is not to represent exactly every sensory element in the situation portrayed, but to select the relevant cues to reaction and to faithfully represent these relevant cues in picture and/or sound. The problem which confronts the film producer is essentially the same as that facing the artist and the sculptor—to select and represent cues relevant to the meaning the artist is attempting to express. Which cues are relevant, depends in turn, on the extent and organization of previous experience of the audience...When pictures are conceived as a medium of communication, rather than as an exact representation of a social situation...decisions...may then be

5 Nilsen, op. cit., p. 17.
based on audience experience and the ability to draw inferences and meanings from cues to experience, rather than on techniques intrinsic to still or motion pictures. 6

A practical implication of this concept of film making is coincidentally seen in the work of David Rawnsley, a British film maker who has been concerned with the simplification of production techniques in the entertainment film. Describing entertainment film makers as a small clique with an inadequate grasp of the nature of their audience, Rawnsley points out the unimaginative and expensive methods involved in current productions which go all out for "realism," and suggests the method of selecting and abstracting the crucial audio-visual cues:

A street scene is built to show a taxi arriving outside a house. An actor is engaged to play the part of the taxi-driver. The star steps from the taxi and pays her fare. She knocks on the front door. An actress is engaged to answer the door in a maid's cap and apron. The maid leads the star down a corridor, through a door and into a room where her lover is waiting. Yet all this elaboration, which simply holds up the story, could be inferred from a design of sound. We could see the lover waiting for his mistress and hear the sound of a car, the ringing down of a taximeter, and the slamming of its door; and this inference could eliminate an orgy of set-building.

An aesthetic case against the film which ignores the universal power of the imagination is too easy to formulate; yet it is worth stressing that sequences which, from the artistic viewpoint, rob a picture of its vitality, are often the most expensive.

Is this the experts' way of telling a story? The living story is told in people and the things they say, with an occasional essential prop necessary for the progress of the story. Was there ever a child who stopped the tale of the Three Bears to inquire about the colour of the

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6 Instructional Film Research, 1918-1950, op. cit., Chap. 8, p. 8.
wall-paper or the "production value" of the ceiling? 7

The challenge is directly put to educational film producers by researchers in the field of motion pictures:

The new techniques being developed in television, due in part to the small receiving screen and to limitations of studio space, time, and funds, may be and most likely are applicable to instructional film production. Quite possibly, the time, facilities, and expense of producing instructional films can be substantially reduced with little, if any, reduction in the instructional effectiveness of the product, and by applying the "crucial cue" hypothesis. Research studies have indicated that lush detail in settings, backgrounds, costumes, furniture, etc., frequently escape the notice of the audience. As large audiences of children, youths and adults become more familiar with the simplified pictorial techniques used in television, the possibility of reducing fidelity and exactness of situational representation in motion pictures, and the possibility of simplifying procedures and the techniques of studio lighting and of reorganizing the pattern of camera angles, are opened up to instructional film producers. 8

It must be repeated that the significance of this approach to film making is not only in the fact that we may, thereby, simplify and economize the production of such films, but also that such design may, at the same time, improve the quality and strengthen the linearity of the film as a medium of communication and as a tool for learning.

The study of specific audio-visual cues in relation to specific audiences, is one for the anthropologist, the sociologist, the psychologist, and the philosopher, as well as the film maker and the teacher, for it is a study of a fundamental human process:

8 Instructional Film Research, 1918-1950, op. cit., Chap. 8, pp. 17-18.
The power of understanding symbols, i.e. of regarding everything about a sense-datum as irrelevant except a certain form that it embodies, is the most characteristic trait of mankind. It issues in an unconscious, spontaneous process of abstraction, which goes on all the time in the human mind: a process of recognizing the concept in any configuration given to experience, and forming a conception accordingly. That is the real sense of Aristotle's definition of man as "the rational animal." Abstractive seeing is the foundation of our rationality, and is its definite guarantee long before the dawn of any conscious generalization or syllogism. It is the function which no other animal shares.9

In the end, such a study must surely lead not only to a technique of film making, but also to a philosophy of film making, to a philosophy of education, and to a way of finding and testing meanings in the symbolic world in which we live.

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BIBLIOGRAPHY
For purposes of convenience, this Bibliography has been divided into the following sections: (1) Books and Pamphlets, (2) Periodical Literature, (3) Essays, (4) Reports, Instructional Film Research Program, The Pennsylvania State College, and (5) Unpublished Material.

1. Books and Pamphlets


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2. Periodical Literature


"How to Increase the Effectiveness of Television Commercials (Part Two)." The Aperture, 15:6-11, 1953.


3. Essays


Schreiber, Robert W. "The Selection and Evaluation of Films."
Film and Education. Godfrey Elliott, editor, New York: Philosophical Library, 1949, pp. 577-590.


4. Reports, Instructional Film Research Program
The Pennsylvania State College


5. Unpublished Material


APPENDIX A

PRODUCERS AND PRODUCTIONS INVOLVED IN THE
PRESENT STUDY OF EDUCATIONAL FILM DESIGN

(1) Adventures of Bunny Rabbit (ENCYCLOPAEDIA BRITANNICA FILMS; 1 reel; black and white; sound; 1937.)

DESCRIPTION: A series of simple episodes in the life of Mrs. Gray Rabbit and her family. The young rabbits are shown as they eat buds and leaves. A fox threatens the nest of rabbits, but is unable to enter. The bunnies grow up and begin to leave the nest. Bunny Rabbit ventures into the farmlands where he meets various animals including a turtle, turkeys, and horses. He is caught by the farmer when he gets into the greenhouse to eat lettuce, and is put into a doll's house by the farmer, but escapes, returning home to the nest.

(2) Colonial Children (ENCYCLOPAEDIA BRITANNICA FILMS; 1 reel; black and white; sound; 1939.)

DESCRIPTION: Colonial life in New England is pictured in the story of Mr. and Mrs. Adams, their two daughters, Rebecca and Cynthia, and their son, Jonathan. We see the family eating a typical colonial breakfast. Family discipline, and the routine of daily work is shown. Jonathan kills a red fox on which a bounty has been placed. Neighbor women help Mrs. Adams with a quilt she is making. The last sequence shows the final chores of the day being performed by candlelight, after which the warming pans are heated, and Mr. Adams reads aloud from the Old Testament.

(3) Gray Squirrel (ENCYCLOPAEDIA BRITANNICA FILMS; 1 reel; black and white; sound; 1938.)

DESCRIPTION: This picture opens with a family of squirrels at breakfast. The baby squirrels are one week old. The mother squirrel builds a summer nest, and leads the young squirrels up the oak tree to their new home. The second sequence shows the squirrels six months later. It is autumn and they store acorns. The time shifts again to the winter months. Brother squirrel is old enough to go out and look for acorns buried in the fall. A red fox appears, but the squirrel climbs up the oak tree to the safety and warmth of the nest.
The Loon's Necklace (Produced by CRAWEY FILMS LIMITED; distributed by ENCYCLOPAEDIA BRITANNICA FILMS INC., 1 reel; color; sound; 1949.)

DESCRIPTION: Based on a North American Indian legend, this is the story of how the loon got its white neckband. Wearing ceremonial masks carved by Indians of British Columbia, a group of actors play out the story of an Indian village besieged by hunger and wolves during a bitter winter. An old blind medicine man named Kelora, uses his magical bow to kill the wolves. In the spring, he goes to the hills to commune with his animal "father" and protector, the loon. He experiences a thunder storm, and the annoyances of swarms of mosquitoes, but finally reaches the lake where the loon lives. Kelora pleads for the gift of sight, and the loon carries him beneath the waters of the lake until Kelora sees again. In return, the old medicine man tosses his dearest treasure, a collar of dentalium shells, to the loon. The necklace falls around the bird's neck, and this, we are told, is the way the loon got its white neckband.

Autumn on the Farm (ENCYCLOPAEDIA BRITANNICA FILMS: 1 reel; color; sound; 1948.)

DESCRIPTION: The film opens on a September day with Joan and Jerry Johnson picking apples. On their way back home they see a grasshopper, goldenrod, wild asters, and milkweed pods. Mr. Johnson is filling the silo, and Mrs. Johnson is picking grapes for jellies. The second sequence shifts to a Saturday in October with Mr. Johnson harvesting corn, Joan and Jerry finding a pumpkin for a Jack-O-Lantern. The children gather hickory nuts, watch a chipmunk storing food for the winter, and see a skunk. The third sequence takes place in November as Joan and Jerry watch mallard ducks flying south. They look in on their flock of turkeys, then race to the house to get warm.

Land of Liberty, Part I (Produced by the MOTION PICTURE PRODUCERS AND DISTRIBUTORS OF AMERICA, INC.; distributed by TEACHING FILM CUSTODIANS; 2 reels; black and white; sound; 1939.)

DESCRIPTION: The film covers the period in American History from the establishment of the colonies until 1805. Using sequences from Hollywood-produced films with historical background, the film shows the settlers combatting nature and the Indians. The Boston Tea Party, Edmund Burke's plea in the House of Commons, the Royal Governor's dismissal of the Virginia House of Burgesses, lead up to Patrick Henry's "liberty or death" speech, and the Revolutionary War. The problems of the new nation under the Articles of Confederation are suggested, and the Bill of Rights are shown. The defeat of the Tripolitanian
pirates and the purchase of the Louisiana Territory con­clude Part I of this film.

(7) **The River** (Produced by Pare Lorentz for the U.S. DEPT. AGRICUL­TURE; distributed by UNITED WORLD; 5 reels; black and white; sound; 1937.)

**DESCRIPTION**: This is a documentary story of the Mississippi River Valley and how, because man upset the balance of Nature by cutting off the timber and planting too much cotton, the river got out of control. In a semi-poetic mood, the music and commentary serve as counterpoint to factual photography with the impact of drama to set the problem before the people. The latter part of the film shows what the Government has done to bring the river back within its banks and keep it there.

(8) **Common Animals of the Woods** (ENCYCLOPAEDIA BRITANNICA FILMS; 1 reel; black and white; sound; 1943.)

**DESCRIPTION**: With the woods as the background, this film is a study of ten different animals in their natural habitats. We see, and note the features of: a squirrel, a young rabbit, a family of raccoons, a porcupine, an otter, a mink with six young ones, a beaver building a dam, a family of opossums, a family of skunks, and back again to the porcupines who are high in the branches of a young birch tree, eating the tender leaves.

(9) **Farm Animals** (ENCYCLOPAEDIA BRITANNICA FILMS; 1 reel; black and white; sound; 1937.)

**DESCRIPTION**: Farmer Brown's alarm clock rings early. It is about five a.m. as he goes to the barn to feed the cows and horses. We learn such terms as "mare," "colt," and "box stall." We see the horses' hooves and notice how the shoes are fit. Farmer Brown harnesses the horses, and his young son rides the mare as they go off to work in the fields. We see the sheep, and learn in some detail how they are sheared. The cows are milked, and, as the end of day draws near, we see the farmer returning homeward.

(10) **Preface to a Life** (Produced by SUN DIAL FILMS, INC. for the NATIONAL INSTITUTE OF MENTAL HEALTH, U.S. PUBLIC HEALTH SERVICE, in cooperation with the U.S. OFFICE OF EDUCATION; distributed by UNITED WORLD FILMS, INC.; 3 reels; black and white; sound; 1950.)

**DESCRIPTION**: This film describes how Michael Thompson, a newborn baby, might develop into one of three different types of adults—the one his mother wants him to be, the one his father expects him to be, and the one which he, himself decides to be. Environmental factors of neighborhood,
school, and home are shown as these are brought to bear on Michael's personality. We see alternate life patterns develop as the result of these conditions, and are shown that only by bringing up a child so that he can develop his personality on his own merits, can parents expect their child to grow into a mature adulthood.

(11) Children's Emotions (Produced by CRAWLEY FILMS LIMITED; distributed by McGRAW-HILL; 2 reels; black and white; sound; 1950.)

DESCRIPTION: The influences conditioning the emotional development of the child from birth are described in this film. The development of curiosity, fear, anger, jealousy, and other emotions are shown. The importance of a happy, secure babyhood is stressed.

(12) Overdependency (Produced by the NATIONAL FILM BOARD OF CANADA; distributed by McGRAW-HILL; 3 reels; black and white; sound; 1949.)

DESCRIPTION: This is the story of James Howard, a young neurotic who learned as a child that sickness brought him extra love and attention. As he grew older, he found he could always gain attention by being sick. Although married, he is still dominated by an overprotective mother on whom he continues to lean. His doctor refers him to a psychiatrist, and the relationship of his past history to this present physical and mental symptoms is explained.

(13) America the Beautiful (Produced by WARNER BROS. PICTURES, INC., as a public service, for the U.S. TREASURY DEPARTMENT; 2 reels; color; sound; 1946.)

DESCRIPTION: This is a travelogue of scenic representations of different sections of the United States. Ranch life, farm life, city life are pictured; the mountains, rivers, and plains are shown, together with Americana taken from Coney Island, a rodeo, and other typical American institutions. The immensity of American industry is suggested. The final message of the picture is an appeal to purchase of United States Treasury Bonds as "shares in America the beautiful."

(14) Angry Boy (Produced by AFFILIATED, for the MENTAL HEALTH FILM BOARD; distributed by INTERNATIONAL FILM BUREAU; 3 reels; black and white; sound; 1951.)

DESCRIPTION: One of a series of films entitled "Emotions of Everyday Living," this is the story of Tommy Randall, a preadolescent who is caught stealing money from his teacher's purse. Mrs. Randall is put in touch with the Child Guidance Bureau, and the psychiatric social worker social worker begins to see some of the reasons for Tommy's hostility in the
mother's attitude towards her family. She dominates her husband and her child, and is, in turn, dominated by her own mother. Tommy comes under the care of Dr. Marshall, in the Huron Valley Child Guidance Clinic. As the family situation is clarified, some improvement is seen in both Tommy and Mrs. Randall, and the reasons for their tensions and frustrations are brought to the level of consciousness.

(15) Human Reproduction (Produced by AUDIO PRODUCTIONS, INC., for McGRAW-HILL; 2 reels; black and white; sound; 1947.)

DESCRIPTION: John and Mary Burke are discussing the approaching motherhood of a friend. Young Johnny Burke, listening to the conversation asks his father the inevitable question: "Where do babies come from, anyhow?" The body of this film consists of simplified explanations of the reproductive systems of the male and female designed to help the father answer his son accurately and simply. Through drawings, charts, and animation, the development of the child from conception to birth is illustrated.

(16) Learning to Understand Children, Part I (McGRAW-HILL TEXT FILMS; 2 reels; black and white; sound; 1947.)

DESCRIPTION: "This is the story of a child who was different." Ada Adams comes from an underprivileged home. She is shy, insecure, emotionally disturbed. Her teacher, Mary Brown, tells the story in her own words. Miss Brown notes Ada's symptoms, talks with her, visits her home, seeking to find the answer to Ada's difficulties. The teacher discovers that Ada has artistic talent. This she turns to advantage by asking Ada to allow her to show some of Ada's drawings to the class. This is the beginning of Ada's rehabilitation as the importance of understanding individual differences in children is made clear.

(17) Feeling of Hostility (Produced by the NATIONAL FILM BOARD OF CANADA; distributed by McGRAW-HILL; 2½ reels; black and white; sound; 1948.)

DESCRIPTION: When Clare was four years old, her father, a mining engineer, was killed in an accident. She leans on her mother, but when her mother decides to marry again, and when a baby brother arrives to divide the mother's attention even further, Clare tries to get affection and attention in other ways. She learns to excel in school work. This brings her attention from the teacher, and from her classmates. But her life is emotionally unsatisfying, and her personal relationships are stunted. She achieves academic success in college, and is editor of the school paper, but she lives a frustrated life. After graduation she gets a job in a publishing firm.
where she begins to channel her hostilities into constructive work. The film is primarily for "psychiatrists treating patients with personality problems," according to a subtitle at the beginning of the film. The last sequence is a talk by "an expert," who makes a point by point summary of the important points in this case history.

(18) Broader Concept of Method, Part I (McGraw-Hill Text Films; 1 reel; black and white; sound; 1947.)

DESCRIPTION: This film opens with an example of the "lesson hearing" type of teaching in which the teacher expects the students to recite the facts of a chapter in the Civics book, without relating the knowledge to the backgrounds and interests of the group. The futility of rote learning is suggested. The teacher-dominated sequence is contrasted with an alternate approach to method in which class projects are assigned, committee reports are made, informal discussion encouraged, and the class decides to undertake a "clean-up plan" in the school lunchroom as part of their study of civic responsibility. The first part of the film ends with the thought: A real problem is a challenge to youth. Giving pupils a share in planning work stimulates energies that can be directed to worthwhile learning experiences."

(19) Brotherhood of Man (Produced by United Productions of America, for the United Automobile Workers, CIO; distributed by Brandon Films, Inc.; 1 reel; color; sound; 1946.)

DESCRIPTION: This cartoon film is based on the Public Affairs pamphlet, "Races of Mankind," and begins with a situation in which the peoples of the world are suddenly brought into close contact in the same backyard. Henry, the protagonist, is of the white race. He wants to be friendly, but is deterred by his alter-ego, a small green figure who pulls him away. The Mongolian, and the Negro representatives also have their "greens," who block the way to brotherhood with suspicion and ignorance. The narrator explains away each of the questions about the differences between men, and all finally come to see the essential brotherhood of man, and march forward together to a future of equal opportunities and rights for men of all races, creeds, and colors.

(20) Boundary Lines (Produced by International Film Foundation; distributed by McGraw-Hill; 1 reel; color; sound; 1947.)

DESCRIPTION: This is an animated film, whose purpose is to answer the question: "What is a boundary line?" It puts forth the proposition that "a line is what we choose to make it," showing how boys draw lines between gangs, and how in history, tribe has been pitted against tribe, race against race,
and color against color. It points out that the line between good neighbors is also a boundary, but that it is a small line measured by friendliness, but that when boundary lines grow bigger than men, the results are disastrous to mankind. In an effective sequence the weapons of early man are shown in continual development until we see the atom bomb as it falls on a city. The alternative of self-destruction is contrasted with the hope that we can reduce the boundary lines between men.

(21) Animals Unlimited (Produced by D.P.M. PRODUCTIONS; distributed by FILMS OF THE NATIONS, INC.; 2 reels; color; sound; 1950.)

DESCRIPTION: The locale of this film is Kruger National Park in the Union of South Africa. A great variety of forms of plant life, and more than thirty different animals and birds are shown. A kill by a lioness, a fight by two crocodiles, and close up shots of many dangerous animals such as the cobra, and the puff adder, add dramatic quality to the presentation. The fact that visitors can come to this jungle paradise without fear of undue hardships is suggested by a few scenes showing campers getting breakfast, and by shots showing lions and elephants leisurely crossing well-paved highways which run through the Park.
### TABLE I

ANALYSIS OF FILM AND SCENE LENGTH

<table>
<thead>
<tr>
<th>SCHOOL FILMS</th>
<th>Film Length</th>
<th>Total No. Scenes</th>
<th>Av. Scene Length</th>
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<tr>
<td></td>
<td>Ft. Min.</td>
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<td>Ft. Sec.</td>
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<tr>
<td>Ad. Bunny Rabbit</td>
<td>352</td>
<td>10</td>
<td>92</td>
</tr>
<tr>
<td>Col. Children</td>
<td>393</td>
<td>11</td>
<td>86</td>
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<tr>
<td>Gray Squirrel</td>
<td>391</td>
<td>11</td>
<td>77 (a)</td>
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<td>Loom's Necklace</td>
<td>373</td>
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<td>68</td>
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<tr>
<td>Autumn on Farm</td>
<td>356</td>
<td>10</td>
<td>79 (b)</td>
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<td>Land Liberty (I)</td>
<td>750</td>
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<td>235</td>
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<tr>
<td>The River</td>
<td>1082</td>
<td>30</td>
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<tr>
<td>Common Animals</td>
<td>398</td>
<td>11</td>
<td>89</td>
</tr>
<tr>
<td>Farm Animals</td>
<td>398</td>
<td>11</td>
<td>100 (c)</td>
</tr>
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</table>

Average film length ..... 502 feet (15 min.)
Average scene length ..... 4.1 feet (.07 sec.)
Average no. scenes per reel ..... 92

(a) Script lists 84 scenes. (b) Script lists 78 scenes.
(c) Script lists 66 scenes. These differences may be accounted for
by changes made in the editing which were not corrected in the final
script, or by the fact that scripts included in the teachers’ guides
were not completely accurate.

<table>
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<tr>
<th>ADULT FILMS</th>
<th>Film Length</th>
<th>Total No. Scenes</th>
<th>Ave. Scene Length</th>
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<td>241</td>
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<td>Animals Unltd.</td>
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Average film length ..... 795 feet (22 min.)
Average scene length ..... 6.0 feet (10 sec.)
Average no. scenes per reel ..... 76
A Color Film produced by
ENCYCLOPAEDIA BRITANNICA FILMS
in collaboration with
E. LAURENCE PALMER, Ph.D.
CORNELL UNIVERSITY

WHAT THE FILM SHOWS

AUTUMN ON THE FARM is one of a series of four films on the seasons. Filmed during the months of September, October, and November, it is a delightful portrait of the autumn season, the time of harvest and of preparation for the winter months ahead. The location for AUTUMN ON THE FARM is the same as that used for the other films in the series. This similarity of background in all films makes possible a careful study of seasonal contrasts in color, plant development and animal activity.

The film opens on a lovely September day. We find Joan and Jerry Johnson in the orchard picking apples. While they are at work, Joan notices a grasshopper sitting on the edge of the apple basket, and we learn that there are many grasshoppers in the orchard in September. When the apple basket is full, we follow Joan and Jerry as they start for the house. On their way they see goldenrod, wild asters, and milkweed pods. Mr. Johnson is busy filling the silo. In the vineyard Mrs. Johnson is picking grapes for jam and knows the whole family will enjoy all winter. Of course the children hunger long enough to sample the grapes.

On a Saturday in October Father is harvesting corn with a machine attached to his tractor. In the cornfield Joan and Jerry find pumpkins and select one for a Jack-O'-Lantern. Leaving the cornfield, they go to the woods to gather nuts. Hickory nuts are plentiful in the woods, and the children eagerly start filling their pails. Jerry looks up and sees a chipmunk busily searching for food to store for the winter. Joan stops picking up nuts to gather some colored leaves. While she is doing this, she sees a skunk looking for food. The skunk is fat and sleek, almost ready for his winter sleep.

On a cold morning in November we find Joan and Jerry at the pond watching some mallard ducks that have landed there on their way south. When the ducks fly away, Joan and Jerry start back to the house. On the way they see wild pheasants and the Johnsons' flock of turkeys. Jerry points out the turkey that he would like to have for Thanksgiving dinner. By now the children feel the cold of the brisk November wind so Joan challenges Jerry to a race, and they run quickly to the house.

ENCYCLOPAEDIA BRITANNICA FILMS INC.
WILMETTE, ILLINOIS

TEACHER'S GUIDE FOR AUTUMN ON THE FARM
PLAN the film presentation. Prepare your students and make sure that specific purposes for seeing the film have been clearly established.

This film was planned to...

... describe the characteristics of autumn on a farm.
... illustrate some of the things farmers do in preparing for winter.
... reveal the changes that take place in plant life during autumn.
... portray how some animals prepare for winter by storing food, hibernating, and migrating.
... illustrate the enjoyment children can have in observing changes of the autumn season.

PRESENT the film immediately after specific objectives have been formulated.

FOLLOW-UP with discussion immediately after the film presentation to...

... determine the degree to which purposes were accomplished.

... utilize new questions or interests stimulated by the film as springboards into further activities, projects, readings, reports, additional showings of the film. Suggested projects follow:

SCIENCE. Trips to fields, woods, parks, and ponds are natural follow-up activities for AUTUMN ON THE FARM. There, children may find nature’s answers to many of the questions that grow out of the film showing. What trees lose their leaves? What fruits, grains, and vegetables are harvested in the autumn? What birds migrate? In what different ways do animals develop that help them survive the winter? Students may wish to make special studies and report on such topics as Hibernating Animals, Migratory Birds, Plants That Scatter Their Own Seeds, Trees That Lose Their Leaves. Suitably labeled exhibits could be made of seeds with special dispersal adaptations (cocklebur, milkweed, etc.). Exhibits of autumn leaves, fall flowers, and autumn products of the farm may also be arranged. The film was made in Wisconsin. Classes may wish to compare autumn as shown in the film with autumn in their own community. If there are differences, they may wish to try to find the reasons for the differences. On a map of the Western Hemisphere, pupils may show the paths taken by migrating birds.

SOCIAL STUDIES. The adaptations that people make to changing seasons should provide a basis for thought and discussion. What changes do people make in their work, clothing, and recreation during seasonal changes? Classes may be interested in studying food storage as it applies to man, domestic animals, and wild animals. In some classes, students may want to study the protection that various states provide for migratory birds. The pheasants shown in the picture may stimulate investigation and discussion of game laws and wildlife conservation. The silage cutter and the corn picker may stimulate interest in a study of farm machinery. It would be interesting to collect pictures that contrast the farm methods of a hundred years ago with those of today.

LANGUAGE AND GRAPHIC ARTS. Following the screening of the film, children will be stimulated to tell or write about their own experiences while observing plants and animals during the autumn months. Such topics as Autumn Leaves, Wild Ducks, Jack Frost, Harvest. Making a Jack-O-Lantern, should suggest materials for stories and poems. Autumn presents ideal subject matter for crayon and watercolor compositions. It is also a good time to use cameras. Some children may be interested in making decorative pieces with autumn leaves, Indian corn, pumpkins, gourds, dried thistles, and autumn flowers.

Many books, stories, and poems have been written about autumn and farm life. Make an exhibit of these on your classroom library table. Indicate with bookmarks, particular stories and poems about autumn.

REVIEW the factual content of the film. Questions such as the following may be useful:

1. What are some of the things animals do in autumn that are different from what they did in spring and summer?
2. Name the autumn flowers that Joan and Jerry saw.
3. How do milkweeds scatter their seeds?
4. What was Mr. Johnson putting in the silo? What is silage used for?
5. What are some of the fruits that ripen in September? What are some of the ways of storing them for use in winter?
6. What kind of nuts did Joan and Jerry find? In what way is a hickory nut like a milkweed seed?
7. What little animal did Jerry see while he was gathering nuts? What was the animal doing?
8. What animal did Joan see while she was gathering leaves? What was it doing?
9. In what direction were the ducks that Joan and Jerry saw probably going? Why were they migrating?
10. Describe the pheasants that Joan and Jerry saw. What do pheasants eat?

FIGURE 14 (cont.)
APPENDIX C

TEACHER GUIDE
To the Classroom Motion Picture

LAND OF LIBERTY (Part I)

Produced by the Motion Picture Industry of the United States

Distributed by Teaching Film Custodians, Inc.
25 West 43rd Street, New York 18, N. Y.

For Use in American History

What the Film Contains: 2 reels, 23 minutes

This film covers the period in American history from the establishment of the colonies until 1805. It depicts the early struggles in the establishment of a home for freedom and democracy.

The first settlers combatted nature and the Indians to build their homes in the wilderness of the New World. After 150 years of self-governing experience, the colonists were justly aroused when the British Government taxed them without representation and denied their rights as English subjects. Although Edmund Burke pleaded the cause of the colonies in the House of Commons, King George arbitrarily continued to enforce his decrees against them. Among other injustices resulting from the King's policies was the dismissal of the Virginia House of Burgesses by the Royal Governor.

When Patrick Henry uttered his impassioned words, "Give me liberty or give me death," he voiced the mood of his countrymen, and the Revolutionary War began with the battle between the Minute Men and the British troops. The Declaration of Independence cut the ties that bound the colonies to the Mother country, and after seven years of hardships Washington's army finally forced the surrender of Cornwallis at Yorktown.

The battle-weary soldiers who returned from the fighting faced grave domestic problems. They had neither money nor jobs. Tariff walls separated the colonies which were united in name only. Everywhere the weaknesses of the Articles of Confederation were apparent and threatened the survival of the new nation. In 1787 delegates from the colonies met in convention at Philadelphia with George Washington presiding. After many debates and compromises, the Constitution was approved. In 1789 the Constitution was amended, and the rights of the people further safeguarded. History knows these amendments as the Bill of Rights.

The United States soon showed its mettle when our infant Navy routed the pirates of Tripoli who had exacted tribute of Mediterranean shipping.

Concluding sequences deal with the purchase of the Louisiana Territory from France during Jefferson's administration as President, and westward migration into West Virginia and Tennessee.

Suggestions for Using the Film:

I. PREVIEW: After reading the above description of the contents of the film and the other material on this guide, preview the motion picture. During this preview, frame your introduction to the film and the purposes for which it is being shown to your class. You will probably want to draw up test items covering the factual information in the film, develop questions for discussion, and consider possible further activities growing out of the showing of the film.

II. PURPOSES OF THE FILM: Prepare your students by introducing the film in such a way that they see a need and reason for viewing it. Make sure that specific purposes have been set up and accepted by the class for the viewing of the film.

Some of the things this film is intended to do are:

1. Summarize the work of the first semester.
2. Show the struggles of a pioneer people.

FIGURE 16

TEACHER'S GUIDE FOR LAND OF LIBERTY (PART I)
3. Show the causes of the Revolutionary War and the Declaration of Independence.

4. Show the weaknesses of the Articles of Confederation which led to the establishment of the Constitution.

5. Show the way our new government began to handle its problems.

III. SHOW THE FILM

IV. TEST: Either an oral or written test covering factual information shown in the films is usually given immediately following the screening.

V. FOLLOW-UP: Discussion must follow the viewing of the film, and usually further activities grow out of the experiences provided by it.

Such questions as the following may stimulate class discussion:

1. What were some of the problems facing the early settlers?

   Early settlers had to wrest their homes and livelihood from a wilderness, relying upon their own strength, ability, and courage. They were equipped for these tasks with almost primitive tools. Trade and commerce were negligible, and transportation and communication were slow and uncertain; thus each family had to be an independent and self-sufficient unit. In addition to these hazards, there was the ever present threat of Indian raids.

2. Why were the colonists justified in resisting the acts of the British Government?

   The decrees of King George III denied the colonists their rights and privileges as English subjects. Originally they sought only to be treated exactly as Englishmen were in the British Isles, and when the British Government spurned their entreaties and continued to enforce the discriminatory decrees, the colonists turned to open rebellion.

3. Why were the Articles of Confederation weak?

   The Articles of Confederation united the Colonies in name only and failed to provide the legislative, executive, and judicial powers required for a strong central government. Serious problems arose because each state could coin its own money, create tariffs, and regulate trade and commerce without regard for the welfare of other states.

4. How did the new Constitution solve these problems?

   The Constitution authorized the establishment of a strong central government with adequate legislative, executive, and judicial powers. Congress, or the legislative branch, was empowered to coin money and regulate inter-state trade and commerce. The checks and balances of the Constitution prevent any individual or group from usurping the power of the people as a whole, and the Amendment Clause provides flexibility to meet the changing needs of the people.

VI. RE-SHOWING: After the test and class discussion, there will usually be points and concepts that can only be clarified by one or more additional showings.

Material, courtesy of the Nebraska Program of Educational Enrichment through the Use of Motion Pictures.

FIGURE 15 (cont.)
APPENDIX D

TABLE II

APPROXIMATE RUNNING TIMES, IN MINUTES, OF REPRESENTATIVE TEACHING FILMS RELEASED BY FOUR LEADING EDUCATIONAL FILM PRODUCERS (a)

<table>
<thead>
<tr>
<th>PRODUCER</th>
<th>TIME</th>
<th>REELS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5-8</td>
<td>9-12</td>
</tr>
<tr>
<td>Coronet</td>
<td>9</td>
<td>427</td>
</tr>
<tr>
<td>E.B. F.</td>
<td>12</td>
<td>77</td>
</tr>
<tr>
<td>McGraw-Hill</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Young America</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>656</strong></td>
</tr>
</tbody>
</table>

(a) These figures are derived from descriptions in the 1952-1953-catalogues and supplements published by the producers mentioned. They do not include all the films released by each company, but rather represent recent trends and films recently publicized by these producers.
### APPENDIX D

#### TABLE II

Approximate Running Times, in Minutes, of Representative Teaching Films Released by Four Leading Educational Film Producers (a)

<table>
<thead>
<tr>
<th>PRODUCER</th>
<th>TIME REELS</th>
<th>5-8</th>
<th>9-12</th>
<th>13-15</th>
<th>16-22</th>
<th>23-30</th>
<th>31+</th>
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<tbody>
<tr>
<td>Coronet</td>
<td>9</td>
<td>427</td>
<td>50</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>E.B.F.</td>
<td>12</td>
<td>77</td>
<td>10</td>
<td>55</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>McGraw-Hill</td>
<td>12</td>
<td>38</td>
<td>22</td>
<td>37</td>
<td>9</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Young America</td>
<td>2</td>
<td>114</td>
<td>11</td>
<td>1</td>
<td>2</td>
<td>0</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>656</strong></td>
<td><strong>93</strong></td>
<td><strong>94</strong></td>
<td><strong>17</strong></td>
<td><strong>6</strong></td>
<td></td>
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</table>

(a) These figures are derived from descriptions in the 1952-1953 catalogues and supplements published by the producers mentioned. They do not include all the films released by each company, but rather represent recent trends and films recently publicized by these producers.
## APPENDIX E

### TABLE III

**AN ANALYSIS OF VOCABULARY LEVEL, SENTENCE LENGTH, AND RATE OF VERBAL DELIVERY**

<table>
<thead>
<tr>
<th>SCHOOL FILMS</th>
<th>Dale-Chall Raw Score</th>
<th>Average Corrected Grade-Level</th>
<th>Average Sentence Length (a)</th>
<th>Average Verbal Delivery (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad. Bunny Rabbit</td>
<td>4.71</td>
<td>4</td>
<td>12.0</td>
<td>136</td>
</tr>
<tr>
<td>Col. Children</td>
<td>5.39</td>
<td>5-6</td>
<td>11.7</td>
<td>132</td>
</tr>
<tr>
<td>Gray Squirrel</td>
<td>4.04</td>
<td>4</td>
<td>7.8</td>
<td>90</td>
</tr>
<tr>
<td>Loon's Necklace</td>
<td>5.85</td>
<td>5-6</td>
<td>13.5</td>
<td>112</td>
</tr>
<tr>
<td>Autumn on Farm</td>
<td>4.71</td>
<td>4</td>
<td>12.0</td>
<td>122</td>
</tr>
<tr>
<td>Land Liberty (I)</td>
<td>6.61</td>
<td>7-8</td>
<td>10.2</td>
<td>130</td>
</tr>
<tr>
<td>The River</td>
<td>7.39</td>
<td>9-10</td>
<td>36.8</td>
<td>155</td>
</tr>
<tr>
<td>Common Animals</td>
<td>5.31</td>
<td>5-6</td>
<td>11.5</td>
<td>127</td>
</tr>
<tr>
<td>Farm Animals</td>
<td>4.48</td>
<td>4</td>
<td>10.6</td>
<td>111</td>
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<tr>
<td><strong>Total Averages</strong></td>
<td><strong>5.37</strong></td>
<td><strong>5-6</strong></td>
<td><strong>13.9</strong></td>
<td><strong>123</strong></td>
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</tbody>
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<table>
<thead>
<tr>
<th>ADULT FILMS</th>
<th>Dale-Chall Raw Score</th>
<th>Average Corrected Grade-Level</th>
<th>Average Sentence Length (a)</th>
<th>Average Verbal Delivery (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pref. to Life</td>
<td>5.20</td>
<td>5-6</td>
<td>11.5</td>
<td>109</td>
</tr>
<tr>
<td>The River</td>
<td>7.39</td>
<td>9-10</td>
<td>36.6</td>
<td>155</td>
</tr>
<tr>
<td>Child. Emotions</td>
<td>5.60</td>
<td>5-6</td>
<td>11.2</td>
<td>121</td>
</tr>
<tr>
<td>Overdependency</td>
<td>5.83</td>
<td>5-6</td>
<td>11.4</td>
<td>116</td>
</tr>
<tr>
<td>Am. the Beautiful</td>
<td>6.39</td>
<td>7-8</td>
<td>16.1</td>
<td>131</td>
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<tr>
<td>Angry Boy</td>
<td>4.71</td>
<td>4</td>
<td>8.5</td>
<td>153</td>
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<tr>
<td>Human Reproduction</td>
<td>7.55</td>
<td>9-10</td>
<td>14.6</td>
<td>123</td>
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<tr>
<td>Understand. Child. (I)</td>
<td>6.18</td>
<td>7-8</td>
<td>13.8</td>
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<tr>
<td>Feeling Hostility</td>
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<tr>
<td>Broader Method (I)</td>
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<tr>
<td>Brotherhood Man</td>
<td>6.17</td>
<td>7-8</td>
<td>16.0</td>
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<td>Boundary Lines</td>
<td>6.39</td>
<td>7-8</td>
<td>13.2</td>
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<tr>
<td>Animals Unltd.</td>
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<td>7-8</td>
<td>20.0</td>
<td>115</td>
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<tr>
<td><strong>Total Averages</strong></td>
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<td><strong>7-8</strong></td>
<td><strong>21.0</strong></td>
<td><strong>118</strong></td>
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(a) Determined as part of the Dale-Chall analysis.
(b) In terms of words per minute on the basis of passages analyzed for vocabulary level.
APPENDIX F

Method for Recording Long Shots, Medium Shots, Close-ups, Optical, and Special Effects

Many of the scripts of the films in the present study were not completely accurate in their technical descriptions of scenes and optical effects. In some cases, perhaps, they were preliminary, rather than final scripts. In other cases, as with the Encyclopaedia Britannica films for the elementary levels, they were intended for use by teachers and were simplified for this purpose.

In the present analysis, the writer made a simple check list of long shots, medium shots, close-ups, and the standard optical devices, including special effects, as these occurred during observation of each film.

The definition of "long shot," "medium shot," and "close-up," of course is relative, depending on the nature of the principal subject matter, and on the relation of each shot to the foregoing shot. A "long shot" of a human figure, for example, is generally understood to be one in which the whole figure is shown, the "medium shot," is a view from the waist up, and the "close-up" is a portrait. There are, of course, intermediate camera positions, such as the "medium close-up," the "extreme close-up," and the like.

The writer tried to identify each shot in terms of the type of subject matter and the relationship of the establishing shot to subsequent shots in the same sequence. Long shots were designated by the number "1" on the check list, medium shots "2", and close-ups "3". The criterion, however, remains somewhat subjective on this point.
Optical effects, on the other hand, can be positively identified and counted, since there are standard definitions of these effects, and they may be easily recognized by the practiced eye.

The "fade-in" is an optical effect in which the image appears from a black screen in a slow, precisely-controlled gradation commonly occupying 20 frames in 16mm films. The "fade-out" is the reverse of the fade-in, the image gradually going to black. Both types of fades were indicated on the check list as "F."

The "dissolve" is a superimposed fade-in and fade-out. It is sometimes called a "lap-dissolve," and usually occupies 40 frames, or one foot of 16mm film. Dissolves were designated "D" on the check list.

The "wipe" also occupies about 40 frames of 16mm film, and may occur in any one of a number of patterns. The letter "W" was used to indicate this effect.

Dolly shots, process shots, and other special camera effects were noted marginally. A separate showing of each film was usually necessary for the study of such effects.
APPENDIX F

Sample Check List Used in Recording Long Shots, Medium Shots, Close ups, Optical, and Special Effects

<table>
<thead>
<tr>
<th>FILM TITLE</th>
<th>Overdependency</th>
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<tr>
<td>F 3</td>
<td>D 2 F 2</td>
</tr>
<tr>
<td>2</td>
<td>1 2</td>
</tr>
<tr>
<td>1</td>
<td>2 2 D 1</td>
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<td>2</td>
<td>2 1 2</td>
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<td>3</td>
<td>2 3 1 D 2</td>
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<td>3</td>
<td>2 1 2</td>
</tr>
<tr>
<td>D 1</td>
<td>3 1 D 2</td>
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<tr>
<td>F 3-1 (dolly)</td>
<td>2 (animation)</td>
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<tr>
<td>3</td>
<td>D 3</td>
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<tr>
<td>2</td>
<td>3 1</td>
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<tr>
<td>3</td>
<td>1-3 (dolly) 3 2</td>
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</tr>
<tr>
<td>3</td>
<td>D 3</td>
</tr>
<tr>
<td>3</td>
<td>D 1</td>
</tr>
<tr>
<td>3-2-3 (dolly)</td>
<td>D 2 3 F 1</td>
</tr>
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<td>2</td>
<td>D 2 D 2</td>
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<tr>
<td>2</td>
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<td>2 2 2 2</td>
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<td>3 3 2 (dolly) 2</td>
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<tr>
<td>2-1 (dolly)</td>
<td>D 2 1 (process)</td>
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<td>3 (de-focus) D 1</td>
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<td>D 2 D 2</td>
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<tr>
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<td>3 D 3</td>
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<td>2 2</td>
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<tr>
<td>1</td>
<td>2 2</td>
</tr>
</tbody>
</table>

Key: "1" - long shot; "2" - medium shot; "3" - close up.
"F" - Fade-in, Fade-out; "D" - Dissolve; "W" - Wipe.
### APPENDIX F

#### TABLE IV

ANALYSIS OF CAMERA INTERPRETATION WITH REFERENCE TO LONG SHOTS, MEDIUM SHOTS, AND CLOSE-UPS (a)

<table>
<thead>
<tr>
<th>SCHOOL FILMS</th>
<th>Long Shots</th>
<th>Medium Shots</th>
<th>Close-Ups</th>
<th>Total No. Scenes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad. Bunny Rabbit</td>
<td>6</td>
<td>31</td>
<td>55</td>
<td>92</td>
</tr>
<tr>
<td>Col. Children</td>
<td>8</td>
<td>49</td>
<td>29</td>
<td>86</td>
</tr>
<tr>
<td>Gray Squirrel</td>
<td>10</td>
<td>47</td>
<td>20</td>
<td>77</td>
</tr>
<tr>
<td>Loon's Necklace</td>
<td>18</td>
<td>15</td>
<td>35</td>
<td>68</td>
</tr>
<tr>
<td>Autumn on Farm</td>
<td>11</td>
<td>44</td>
<td>24</td>
<td>79</td>
</tr>
<tr>
<td>Land Liberty (I)</td>
<td>105</td>
<td>83</td>
<td>47</td>
<td>235</td>
</tr>
<tr>
<td>The River</td>
<td>168</td>
<td>110</td>
<td>83</td>
<td>361</td>
</tr>
<tr>
<td>Common Animals</td>
<td>12</td>
<td>29</td>
<td>48</td>
<td>89</td>
</tr>
<tr>
<td>Farm Animals</td>
<td>19</td>
<td>49</td>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>357</strong></td>
<td><strong>457</strong></td>
<td><strong>373</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADULT FILMS</th>
<th>Long Shots</th>
<th>Medium Shots</th>
<th>Close-Ups</th>
<th>Total No. Scenes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pref. to Life</td>
<td>50</td>
<td>90</td>
<td>101</td>
<td>241</td>
</tr>
<tr>
<td>The River</td>
<td>168</td>
<td>110</td>
<td>83</td>
<td>361</td>
</tr>
<tr>
<td>Child. Emotions</td>
<td>9</td>
<td>81</td>
<td>89</td>
<td>179</td>
</tr>
<tr>
<td>Overdependency</td>
<td>40</td>
<td>78</td>
<td>40</td>
<td>158</td>
</tr>
<tr>
<td>Am. the Beautiful</td>
<td>155</td>
<td>87</td>
<td>21</td>
<td>263</td>
</tr>
<tr>
<td>Angry Boy</td>
<td>7</td>
<td>99</td>
<td>136</td>
<td>242</td>
</tr>
<tr>
<td>Human Reprod.</td>
<td>3</td>
<td>3</td>
<td>49</td>
<td>55</td>
</tr>
<tr>
<td>Understand. Child. (I)</td>
<td>36</td>
<td>73</td>
<td>12</td>
<td>121</td>
</tr>
<tr>
<td>Feeling Hostility</td>
<td>15</td>
<td>73</td>
<td>51</td>
<td>159</td>
</tr>
<tr>
<td>Broader Method (I)</td>
<td>28</td>
<td>42</td>
<td>9</td>
<td>79</td>
</tr>
<tr>
<td>Brotherhood Man</td>
<td>(b)-</td>
<td>--</td>
<td>--</td>
<td>32</td>
</tr>
<tr>
<td>Boundary Lines</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>106</td>
</tr>
<tr>
<td>Animals Unlt.d.</td>
<td>38</td>
<td>74</td>
<td>33</td>
<td>145</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>549</strong></td>
<td><strong>810</strong></td>
<td><strong>624</strong></td>
<td></td>
</tr>
</tbody>
</table>

(a) These descriptions are not absolute, since distinctions between "long shot," "medium shot," and "close-up" are relative. In some cases, for example, a scene might have been more accurately described as a "medium close-up," a "medium long shot," etc. They do serve, however, as a generalized picture of scene structure.

(b) Brotherhood of Man, and Boundary Lines were excluded from the analysis because of their cartoon form. Figures on the total number of scenes in these films were taken directly from the scenes listed in the scripts of the films.
## APPENDIX G

### TABLE V

**A Comparison of Black and White vs. Color Productions of Four Leading Educational Film Producers (a)**

<table>
<thead>
<tr>
<th>Producer</th>
<th>Black &amp; White</th>
<th>Color</th>
<th>B. &amp; W. And Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronet Instructional Films</td>
<td>35</td>
<td>15</td>
<td>439</td>
</tr>
<tr>
<td>Encyclopaedia Britannica Films</td>
<td>70</td>
<td>65</td>
<td>28</td>
</tr>
<tr>
<td>McGraw-Hill Text-Films</td>
<td>104</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Young America Films</td>
<td>129</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>336</strong></td>
<td><strong>88</strong></td>
<td><strong>477</strong></td>
</tr>
</tbody>
</table>

(a) These figures are derived from descriptions in the 1963 catalogues and supplements published by the producers mentioned. They do not include all films released by each company. For example, the Encyclopaedia Britannica figures represent only titles recently released and announced in the 1952-1955 supplement. The McGraw-Hill lists does not include 76 March of Time films and 97 films in the This Is America series, all of which are black and white. The figures do, however, indicate the relative importance of color with regard to the four producers listed.
## APPENDIX H

### TABLE VI

ANALYSIS OF OPTICAL EFFECTS WITH REFERENCE TO FADES, DISSOLVES, AND WIPES (a)

<table>
<thead>
<tr>
<th>SCHOOL FILMS</th>
<th>Fades</th>
<th>Dissolves</th>
<th>Wipes</th>
<th>Total No. Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad. Bunny Rabbit</td>
<td>4</td>
<td>9</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Col. Children</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Gray Squirrel</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Loom's Necklace</td>
<td>11</td>
<td>21</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Autumn on Farm</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Land Liberty (I)</td>
<td>10</td>
<td>51</td>
<td>0</td>
<td>61</td>
</tr>
<tr>
<td>The River</td>
<td>7</td>
<td>17</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Common Animals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Farm Animals</td>
<td>7</td>
<td>13</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
<td><strong>113</strong></td>
<td><strong>2</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADULT FILMS</th>
<th>Fades</th>
<th>Dissolves</th>
<th>Wipes</th>
<th>Total No. Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pref. to Life</td>
<td>3</td>
<td>62</td>
<td>4</td>
<td>69</td>
</tr>
<tr>
<td>The River</td>
<td>7</td>
<td>17</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Child. Emotions</td>
<td>18</td>
<td>20</td>
<td>0</td>
<td>38</td>
</tr>
<tr>
<td>Overdependency</td>
<td>9</td>
<td>26</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>Am. the Beautiful</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Angry Boy</td>
<td>3</td>
<td>6</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Human Reprod.</td>
<td>10</td>
<td>5</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Understand. Child. (I)</td>
<td>3</td>
<td>29</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Feeling Hostility</td>
<td>11</td>
<td>26</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>Broader Method (I)</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Brotherhood Man (b)</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Boundary Lines</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Animals Unltd.</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>75</strong></td>
<td><strong>197</strong></td>
<td><strong>4</strong></td>
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</tr>
</tbody>
</table>

(a) Figures represent effects used only in the main body of the films, and do not include those opticals used in titles.

(b) Brotherhood of Man and Boundary Lines were omitted from this analysis because of their animated form.
I, Robert Walter Wagner, was born in Newport News, Virginia, November 16, 1913. My secondary school education was secured at South High School, in Columbus, Ohio. I took my undergraduate work at The Ohio State University, receiving the Bachelor of Science degree in 1940, after which, as Graduate Assistant in the Department of Photography, I continued work leading to the degree of Master of Arts in 1941.

Following a brief appointment as Research Assistant in the Bureau of Educational Research at The Ohio State University, I produced motion pictures for the Office of Emergency Management in Washington, D.C., The Office of War Information, in New York City, and The Office of the Coordinator of Inter-American Affairs in South and Central America.

In 1944, while Chief of the Mental Hygiene Information Service of the Ohio State Department of Public Welfare, I was appointed Assistant Professor and Research Associate in the Bureau of Educational Research at The Ohio State University.

In 1946, I became Assistant Professor in the Department of Photography at The Ohio State University. During the following years, I taught summer courses in the production of motion pictures and audio-visual materials at the University of North Carolina, The Ohio State University, The Colorado State College of Education, and The University of Southern California.
In 1951, I was granted leave of absence from The Ohio State University in order to participate in an educational film production project in Turkey undertaken by Syracuse University for the U. S. Department of State. Upon return to the United States in 1952, I began residence in the Graduate School of The Ohio State University under the terms of a Fellowship granted by Encyclopaedia Britannica Films, Inc.

In the fall of 1952, upon termination of my leave of absence, I returned to the Department of Photography as Instructor, while completing the requirements for the degree Doctor of Philosophy.